RICHARD A. CARTER

War Machine

WAR MACHINE

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Notes on the Text

War Machine is speculative sounding of the myriad entanglements of technology, ecology, discourse, politics, and conflict shaping the planetary environment. In this context, objects, activities, and environments cannot be readily separated from one another, or their varied affects distilled into clear lines of causality and analytical insight, challenging efforts at narrating their characteristics through words alone. It is on this basis that *War Machine* has been created not as a conventional academic text, but in the mode of generative, more-than-textual criticism and poetry, driven by "esoteric" algorithmic processes. The aim in doing so is to depict juxtapositions of intra-acting phenomena whose frictions, contrasts, tensions, and ambiguities can be registered better through emergent material performances, both in the processes of composition and on the page itself, rather than through the crisp, clipped certainties of conventionally written scholarship and its attended vectors of argument. In short, *War Machine* deploys experimental formal techniques in an attempt to *enfold* and *perform,* rather than simply describe, an uncertain fusion of competing discourses and activities. The subsequent stream of outputs and interpretive potentials necessarily precludes the ascendency of any "definitive" critical narration and resists any straightforward integration with current academic canons of worldly

diagnosis. Nevertheless, it is forwarded here that speculative practices such as this can facilitate the creation of different stories, and especially different *kinds* of stories, concerning current challenges. Speculative work is well placed to model adventurous, forward-facing approaches, across both thought and practice, that refuses inaction when dealing with extremely challenging scenarios. It can acknowledge head-on varied problematics and their attended uncertainties and doubts, through sheer material necessity, while still contributing to the aesthetic, affective, and conceptual foundations from which alternative modes of worldly knowing and being can be developed and justified. The outcome of such work is to instantiate, once more, how the conjunction of art and criticism can respond meaningfully to the fierce difficulties of the present moment, especially when their immediate powers of rectification are often minimal, and when the harms engaged are too widespread and too far embedded to ever fully mitigate.

* * *

The core premise of this text involves staging a digitally simulated wargame that stands in for the multitude of political, rhetorical, and economic battles that are presently raging across the face of a profoundly endangered planet. Featured are two starkly competing depictions of the Earth: 1) as a body facing extreme threats to its climatic and ecological stability; 2) as a body of valuable resources to be extracted, managed, policed, and contested as part of commercial enterprise and geopolitical strategy. The algorithmic operations behind this wargame are employed as

a generative procedure to assemble a flowing textual approximation of these contrasting worldviews, imaginaries, and rhetorics as they intersect, reframe, and compete with one another, their weight of meaning and influence ever-shifting and being driven by the very energies and materials they attempt to account for, albeit in very different ways. The antagonistic discourse yielded by this process is invariably noisy, fraught, and uncertain, manifesting across a multiplicity of registers and contexts. It oscillates between supporting and undermining the statements made, while nevertheless remaining enframed within a global system of unrestrained extractivism. It was the desire to map this sense of saturated frictions, collisions, and contrasts—the sheer *noise* and *intensity* of contemporary material–discursive exchange—that initially guided the composition of *War Machine.*

* * *

The actual wargames enacted by this text are held between two teams of "drones" that seek to establish strategic control over the game space. The drones themselves are represented as abstract symbols, modelled loosely on US military "Common Warfighting Symbology" unit markers, and they maneuver across a terrain consisting of military Tactical Pilotage Charts (TPCs) depicting environments marked on a "Red List" of endangered ecosystems maintained by the International Union for the Conservation of Nature (IUCN). This Red List has been devised to act as a common resource informing decision makers about current ecological threats, their management, and conserva-

tional requirements, as well as facilitating public awareness-raising (IUCN 2023).

The rules of the game are that each drone is assigned an arbitrary strength value and a grid position on "friendly" terrain near allied units. The strength values of each drone radiate outwards, diminishing in proportion to distance, across a gridded "influence map," and these values can either combine with those of neighboring allies or be negated entirely by the presence of those belonging to the opposition. The terrain itself can also pose some measure of resistance, in eroding the tactical "reach" of a given drone. It is this undulating influence map that furnishes each drone with the necessary spatial and tactical awareness to operate. The drones employ a simple form of AI in order to advance across the terrain toward opposing units, attempting to project and combine their radiating zones of influence so as to numerically cancel out or even wholly envelope and eradicate those of the opposition. If a drone finds itself in a space where the opposing influences surrounding it are greater than its own, it is eliminated from the field, although it endeavors to avoid this fate, if possible.

It is this global influence map that is depicted in the visual half of each poem, with the current location of each drone at a particular timestep being plotted along with a symbolic representation of their tactical status (maneuvering, searching, engaging). Also featured are their intersecting zones of influence, which are demarcated as a numerical field of positive and negative integers. This field subsequently highlights areas of collective strength and weakness between the opposing forces, as well as neutral areas of no overall control.

It is the sequential unfolding of each wargame—evolving in ways similar to that of a cellular automaton—that furnishes a generative mechanism for assembling a granular form of cut-up text. Each grid point of the global influence map under the control of a particular drone faction is used to select a co-located character belonging to an assigned text. As described above, these texts are often rhetorically opposed along numerous vectors: either reporting on the serious dangers facing global habitability or conducting detailed market analyses, with environmental breakdown cast as a risk to supply chains and investment returns. In some cases, the texts involved are of the same kind and effectively compete (even if inadvertently) as part of a noisy information environment that can only be processed within finite envelopes of critical attention.

After a few discrete timesteps of the wargame have passed, the grid field is sampled, and the current mixture of textual characters is then printed opposite to the game visualisation, manifesting as a shifting cloud of contrasting expression, characterized by an uncertain layout, spacing, and fragmentary wording.

* * *

There are several ways that the functional, visual, and textual elements of *War Machine* might be parsed, whether in terms of how to characterize the individual components of each poem-diptych, or to consider what they all might ultimately mean at scales and durations beyond the immediate themes of the text as a whole. The chief power of creative–critical exploration is, in part, its capacity to denaturalize what we understand an *analytical* response

to a body of varied themes, concepts, and concerns might resemble and to facilitate a perspective on them that centers not on the formulation of a diagnostic account—with the pretence of there being clearly separable chains of effect that can be readily understood and (notionally) resolved—but on sounding their generative possibilities for meaning and insight, particularly along the material and affective vectors often sidelined in academic writing, and which often better characterize our experiences and reactions towards a rapidly changing world.

These rarefied aspirations aside, however, it should also be acknowledged that convention and constraint can rarely be foregone entirely in published work, and considerable caution should always be sounded against any claim, implicit or otherwise, that a text or art object is readily accessible, even self-explanatory, for all audiences across all contexts. In the aforementioned spirit of using friction and ambiguity generatively in order to tell a variety of possible tales, it is therefore worth outlining a few notes concerning what are the more evident themes engaged by *War Machine*—those which often served as its direct inspiration—and to provide some entryways into how they might be considered.

* * *

War Machine emerged partly in reflection of the long history of wargaming itself, as a tool for simulating and predicting battlefield contingencies. Modern professional wargaming can be traced back to the Prussian *Kriegsspiel* in the early 19th Century (Peterson 2023), and continues to be a prominent feature in the context of military training and

planning, whether manifest in the form of physical maps and models or computerized emulations of such (Brynen 2020; Reddie et al. 2018). The subsequent application of "wargaming," often more as a planning concept than a rules-based model, is also apparent in various other domains that are predicated on managing and responding to evolving challenges, contingencies, and threats, such as political strategizing and business forecasting (Kurtz 2003).

While ecological factors do often play a role in contemporary military wargaming, in terms of accounting for its logistical and operational impacts, they have occasionally featured in the context of security response planning for a changing world, with the opposing "forces" being the deteriorating planetary environment. In one instance (Boulton 2023), the climatic-ecological "hyperobject"—in Morton's sense (2013) of a hyperdistributed set of relations exceeding all possible observational frames—is parsed as a centrifugal "hyperthreat" which needs to be tackled across all fronts. This particular characterization of environmental breakdown as a quasi-military challenge, amenable to the logics and rhetorics of security operations and strategic "threat postures," is an uncomfortable one, given how military activities are an essential part of the forces perpetuating the dangers at play (Parkinson and Cottrell 2021). This invites subsequent reflection on whether a continuation of these outlooks could in any way contribute to the transformative shift in political and economic consciousness required (a point forwarded by Warner and Boas 2019). The overall posture of privileged nations toward the wider planet can certainly be characterized as that of a war machine, seeking to obtain the total subjugation of Earthly resources, and to maximize the logistical efficien-

cies by which these can be extracted and applied, irrespective of the costs borne by the humans and animals living in their vicinity, or the stability of the global environment. It is here that the concept of wargaming commercial scenarios and threats to business growth have far more immediate resonance, and the blunt image of geopolitically framed, commercially underpinned battles over fragile (but potentially resource-rich) ecological spaces was one of the darker points of inspiration behind *War Machine.*

The evident counter to this bleak perspective is in restating a broader vision of gameplay as a generative process for highlighting and simulating structural issues in the world—or, at least, fostering an attitude that emphasizes the possibility of concrete action over its presupposed futility (Wilkinson 2016). We can cite here the growing body of recent table tops titles that engage ecological themes. Some titles, such as *PARKS* (2019), *TRAILS* (2021) or *Fjords* (2022) focus on exploration. Other titles emphasise the detailed simulation or even transformation of the Earthly environment, such as *Photosynthesis* (2017), *Ecology* (2019), *Canopy* (2021), and *Daybreak* (2023). In contrast, *digital* games tend to frame natural spaces in a largely exploratory, narrative, or ambient mode, rather than as a system to be engaged, e.g., *Flower* (2009), *Firewatch* (2016), *Walden, a game* (2017), *Eastshade* (2019), *Beyond Blue* (2020), and *Naiad* (2024). A few more strongly educational or activist titles do exist, however, that acknowledge the presence and agency of the more-than-human world, e.g. the *Shelter* series (2013–2021), *Lumino City* (2014), *Never Alone* (2016), and *Lichenia* (2019). In some cases, however, such as *Terra Nil* (2023) or *Planet Crafter* (2024), the processes of tackling ecological harms are presented as a perfect reclamation of

a polluted or desolate space—an effective return to Eden that erases materially embedded histories and harms.

It is interesting to consider that across all these varied instances, the modeling of player agency in relation to the environment stands in marked contrast to the apocalyptic visions of Earthly collapse that are often found in many ecologically charged settings across the wider media landscape, where the principal interest is on combative human struggles in desperate circumstances, rather than on mitigating the harms ensnaring all. While *War Machine* is a self-playing game, and one that depicts the forces driving present challenges, it has nevertheless been made in reflection of the value of games as offering a structure for studying and creatively reimagining different environmental scenarios, inviting onlookers to step outside the immediacies of events driven by certain assumptions of action, outside the "rules of play," and to keep in view the continuing potentials to enact different modes of material engagement, with different possible outcomes arising.

* * *

The technical architectures used in *War Machine* for modeling the forces of conflict and competition were based on the use of computerized influence maps to guide the behavior of individual units in a coherent way. This technique is found within some simple digital wargaming simulations, and is closely aligned with the modeling of spatial AI behaviors and navigation pathfinding within computer games more generally (Mark 2019). The influence propagation algorithm is known specifically as Dijkstra's Algorithm, which was developed originally by mathematician

Edsger Dijkstra for finding the shortest paths between nodes in a weighted graph. A gridded game space can be treated as just such a graph, and by overlapping versions of this space with different weighted features (such as allied and enemy units, or terrain obstacles) it is possible to define objective nodes and trace a path toward them that is responsive to factors beyond distance alone, emulating "intelligent" decision-making.

This detail is worth highlighting because it gives cause for reflecting on the necessary narrowness of all algorithmic operations, and the wider consequences these can generate, despite contemporary excitement around certain forms of "AI" as finally overcoming these limitations. That is, as a simple tool to emulate intelligent pathfinding, Dijkstra's algorithm can only operate on weighted factors that are explicitly fed into it—even if the behaviors generated are not programmed directly as such. In *War Machine,* the game terrain, already a synthetic abstraction, features only relatively weakly in the calculus for the deployed units, and this is a conscious expression of how the overwhelming majority of algorithmic logics governing contemporary life give no regard to their wider environmental contexts, beyond those immediately necessary for executing their central taskings. Although this might appear a wholly irrelevant concern from the pragmatic perspective of software engineering, just as the contemporary built world still instantiates political and economic logics that are predicated on abundant, readily available energy (chiefly from fossil fuels), the logics of the digital world model and assume all actions will take place within broadly stable environmental contexts that will not exceed certain thresholds of change. While this might be a neces-

sary assumption when creating algorithms that function in abstractly digital contexts (e.g., calculate the optimal connections between points in a fixed body of data), if the process is such that it is highly energy intensive, in order to be achievable within reasonable timescales, then the material implications beyond the computational become significant, both economically and environmentally (Caballar 2024). We might cite Clark's (2012) concept of "scale-effects" as an illustration here, in which actions and gestures at one scale can generate impacts at scales far beyond the perceptual and cognitive frames in which they are otherwise "rationally" justified. Computer science and software engineering certainly do place immense value on both speed and efficiency, particularly when facing technological constraints, but as shown by the recent, ballooning expansion of generative AI systems, these pressures can fall away rapidly if the excess hardware capability exists and the economic return is sufficient.

In this regard, there is currently great concern that generative AI systems, in terms of their text and image synthesizing operations, the training demands of creating new models, and the entire supply chain of materials and labor involved in their operation, are placing wholly unsustainable burdens on the Earthly environment (see Crawford 2024; Valdivia 2024), undercutting oft-cited claims that they are critical tools for modeling and managing the very threats being faced (Brevini 2020). These burdens manifest chiefly in the form of the already vast power draw of large data centers and the water consumed in their cooling (see, e.g., Ren 2023; Monserrate 2022), as well as risks that upcoming generations of consumer-grade, device-level AI activity will lead to more intensive

computing operations on average. Proponents of the new systems seemingly pay little attention to these concerns, and speak of a wholesale revolution that will impact every facet of human life, across all contexts, overriding national borders, social disparities, and geographies (Leaver and Srdarov 2023). The result, it is forwarded, will be an age of hyperabundance that will upend conventional economic realities and transform how human beings live in the world at large.

Leaving aside how realistic these predictions or aspirations may ultimately be, it is worth reflecting on their presumption of a deep digital future that will remain untroubled by Earthly events. Prevailing digital imaginaries tacitly hold that the incredible demands of the latest AI systems, which can thrive only in the most rarefied ecological niches we might furnish, can be sustainably met at a global scale both now and into the far future. The notion that digital infrastructures are rendered intensely vulnerable precisely due to their seemingly unrestrained requirements in energy and materials is never broached. Futuristic imaginaries of an AI-transformed human world roundly ignore the growing contingencies of an ecologically deteriorating planet, with all the conflicts and catastrophes this engenders, and the serious risks these will pose to the globally distributed supply chains on which all digital technologies critically rely. In this regard, *War Machine* offers a performative enactment of the self-devouring nature of the digital environment and the sprawling economic ecologies on which it relies. Its constituent parts are not only in active competition with one another—with all the wastage and duplicated effort this implies—but also

scour the resource-rich, often highly vulnerable terrains that are critical for their continued operation.

* * *

Another domain in which the implications of AI systems specifically are looming large is in the context of popular and scholarly debates around automated decision-making architectures, including autonomous weapon systems, and their erosion of the perceptual, conceptual, and legal parameters in which conflicts are defined, conducted, and adjudicated. Armed drones esepcially have long been totemic within these discussions. Even though they stand as being guided by human pilots, the latter's judgment and autonomy, operating as part of a highly integrated and automated surveillance, intelligence, targeting infrastructure, has often fallen under scrutiny (Emery 2020). Richardson (2024) has noted how contemporary technoscientific warfare often surpasses the perceptual and conceptual capacities of the human entities within them, even though the latter are entangled within widely distributed, technocultural platforms of perception, with sensory data and its interpretation shifting from an indexical to an operationalized set of relations. It is in this context that algorithmically crystallized biases and blind spots can contribute to patterns of observation and analysis that materialize the very activities that are "expected" to be seen, driving incidents such as "friendly fire" or misdirected strikes against purely civilian targets, or, in more recent cases, a rapid erosion of critical concern regarding the latter (Emery 2020; McKernan and Davies 2024), raising vital questions regarding where legal accountability ultimately lies.

One final area of widespread concern around the very latest modes of generative AI especially is its applicability for information warfare, whether by manufacturing outright disinformation (Goldstein et al. 2024) or by driving bot activities that pollute, destabilize, and misdirect online discourse such as to break down social trust and cohesion (Hajli et al. 2021). Even if explicitly political activity is still an emerging problem, the capacity for generative AI to accelerate the now unceasing thrum of online "noise" (the "dark media" fabrics of spam, malware, clickbait, and advertorials that erode information retrieval) is well discussed in the popular media, and it is this rendering of contemporary digital life as unpleasant, uncertain, and (at points) unusable that constitutes its chief "threat" (see, e.g., Heikkilä 2023 for a typical journalistic illustration of these concerns).

It is on the subject of generativity, however, that *War Machine* seeks to model an alternative way of thinking through what generative AI technologies and their outputs can potentially represent. Just as the core premise of creative gameplay, as outlined above, is to invite a variety of approaches and modes of seeing toward challenging scenarios, the process of turning the movements of AI conflict into a form of poetry models a vision in which these systems are no longer bound by some inherent destiny toward certain trajectories of use but are shown as the product of conscious choices within contexts that can nevertheless be modified. Richardson's (2024) discussions concerning artistic media resonate here, in noting the power of their material reimagining of what it means to sense and represent the world in an era of intersecting technological, martial, and ecological crises. Speculative gestures and

creative redeployments of media, form, and convention, which lie at the very premise of this particular text, invite opportunities to reflect on and even enact conjunctions of aesthetics and worlds that do not adhere to dominant forms of knowledge-making and media imagination (9). That is, artistic reworkings of established conjunctions of materials and energies make space for other ways of knowing, imagining, and intervening in the world, establishing communicative relationships that trouble existing paradigms, highlight otherwise excluded potentials, and offer avenues for the narration of different stories concerning the capacities of worldly becoming (117).

A useful contextualizing reference regarding the characteristics of *War Machine* is that of so-called "esoteric" programming languages, or "esolangs." These are schemas of computer coding that are deliberately playful, puzzle-like, and ultimately strange compared to well established languages (Temkin 2017b). Instances here include Piet, a visual language designed to resemble abstract artworks (Temkin 2017a); Hexagony, in which the code consists of single character commands arranged along a hexagonal geometry (Temkin 2018); in:verse, which maps a table of words onto shader commands, enabling a written poem to generate an image (Temkin 2020a); or Cree# and 文言/Wenyan, which, for the former, adopts the Cree syllabic alphabet and storytelling traditions as a coding system (Temkin 2021), while the latter adheres to the tonal and grammatical conventions of classical Chinese literature (Temkin 2020b), utilizing traditional Chinese characters exclusively in its composition (both examples being rarities in computing languages that overwhelmingly employ Latin characters and English grammar).

There is an inherent playfulness to these languages, in denaturing established processes of instructing computers, and exploring ideas and concepts beyond the bald pragmatics of programming efficiency. They show us how the vernacular of code is reshaping cultural registers for expressing contemporary experiences and how code also embeds cultural assumptions concerning what "counts" as effective instructional practices.

War Machine is not itself an esolang, in that it employs conventional languages and runtime environments (a variation of Java), but it does offer what might be characterized as a form of esoteric programming, in which established processes for achieving a particular outcome are replaced with deliberately strange, circumlocutory operations that express concepts beyond the ends to which they are directed. Such endeavors have underpinned several of my previous projects, all of which generate poetic outcomes from unusual conjunctions of computing machinery and processes, meditating on what it means for the latter to apprehend and give account of more-than-human phenomena and environments. *War Machine* has been created in a similar vein, turning the bleak calculus of military wargaming and algorithmic combat into an apparatus for assembling reflexively critical concrete poetry, an "alternative AI" modality for generating text. As with esolangs, which Temkin (2023) characterizes as "explicitly refusing practicality and clarity," the point here is not to wholly replace established paradigms but to challenge their apparent stability and self-evidence, to suggest an excess of technical and expressive potential that can be engaged through the subversions of speculative practice, whereby creative insight and resistance are always pos-

sible even within the most rigidly overdetermined technical contexts.

* * *

It is here that an answer might be developed concerning the status of works such as *War Machine* at the present moment. Given the deeply challenging state of the world, it can be asked to what meaningful end creative-critical work can represent and resist the forces at play? Even accepting the above explanations regarding the formal and conceptual inspirations behind this text, the critique remains that such efforts, particularly at the scale conducted here, are unlikely, if ever, to draw the attention of the key actors involved, or have much immediate hope of even beginning to redress the scale of the ongoing harms.

In other fields of scholarly analyses and activist reflection, the nature and scale of global challenges is captured or reflected through a whole array of critical labels, such as "polycrises" or "permacrises" (Turnball 2021); "the Anthropocene/Anglocene/Capitolocene/Plantationocene/Thermocene/Trumpocene" (and other variations: Mentz 2020, 57 counts up to twenty-four); "eco-nihilism" (Mukherjee 2016); "necrocapitalism" (Banerjee 2018); or, more bluntly, "disaster capitalism" (Klein 2008).

All these varied labels address their own particular areas of interest across different historical durations, but they are all broadly diagnosing an Earthly context that, outside the reassuringly thoughtful registers of critical analyses, can be affectively appalling for those who would seek a better future for human and more-than-human alike. In an age characterized by the deleterious inter-

sections of rapid climatic and ecological breakdown at a global scale; an increasingly polluted and unnavigable information environment; an aggressive proliferation of generative AI; growing algorithmic warfare and highly automated weaponry; and all set against a backdrop of zero-sum competition for land, resources, and zones of influence, it would appear straightforward to claim that human capacities to absorb and mitigate such challenges are now thoroughly overwhelmed, with the critical, aesthetic, and emotional registers necessary to conceptualize and tackle them becoming saturated. From this bleak perspective, what is left is effectively *noise:* the traces of disintegrating critical purchase, diffusing emotional resolve, and a breakdown in political efficacy and meaningful agency in the face of unrelenting, overwhelming challenges, along with the varying degrees of despair and indifference this might precipitate. We might readily see such dark visions in the fragmentary character of the poems generated by *War Machine.*

Nevertheless, the riposte to such despondent narratives is straightforward enough to voice, even if thoroughly daunting to implement: what else to do? To endlessly emphasize the worst-case interpretations can be as destructive as any of the forces that are so profoundly damaging the world at present—to effectively declare that there is nothing to be done, and to reiterate the popular, if potentially simplistic interpretation of Fredric Jameson's dictum that "it is easier to imagine the end of the world than the end of Capitalism" (2005, 199).

Leaving aside the perennial debates raised concerning the role and value of art in society at large, one resonant response to the issues described above, as they relate to

this current project, can be found in the practices of so-called "permacomputing." A loose play on the much older concept of "permaculture," permacomputing recognizes the profound environmental impacts generated by computing machinery and infrastructures, inclusive of their manufacture, maintenance, and disposal, and ultimately strives to model alternatives that shift away from the maximalist approaches of commercial deployments (Mansoux et al. 2023). Amongst those practitioners that identify as being invested in permacomputing, the goal is to enact different digital activities and artifacts that emphasize a significantly reduced footprint in energy and materials, embracing the generative productivity of concrete *constraint,* and ultimately aiming to develop approaches and attitudes that recognize and attempt resilience in the face of unrelenting ecological and economic degradation in the deep future (Mansoux et al. 2023). Such efforts also encompass digital creative works that adopt certain principles along a similar vector, and which critique the techno-economic conditions that facilitate the development of resource-intensive computing systems.

War Machine is deliberately quite simple, compared to what it could have been if it had used the latest AI architectures to drive the behavior of its constituent units and the text generated. While it is therefore unrepresentative of the technologies being utilized currently for synthesizing media or even simulating battlefield contingencies, the effect is a relatively minimalist set of operations that bear out a model of computing activity in which constraint forms a key part of the overall gesture being enacted. Here, technological functioning and the surfaces of expression made available combine to enact a different narrative con-

cerning the contemporary environment. Permacomputing strives for just this kind of modality, and while *War Machine* is perhaps not a direct instance, it nevertheless has been created in a similar spirit. The latter extends into the very rationale for pursuing such practices in the first example. The core premise of permacomputing forwards that computing technologies will continue to prevail even in the teeth of a dark and uncertain future and so rejects the apocalyptic narratives of total global collapse that undermine serious thinking about what possibilities can be found to facilitate human and more-than-human flourishing. It is ultimately a refusal of despair and a refusal of the inaction this can all too easily justify. Digital art, conducted in the guise of both contesting current paradigms, while also exploring their possibilities and alternatives, is one manifestation of this. *War Machine* has been created expressly with this thinking in mind, articulating current woes head-on, but also modeling a creative and critical response to such that, it is hoped, resists simplistic narratives of defeatism and finds opportunities amidst the fearsome complexities and challenges.

It is the speculative nature of this response that forms one final aspect of the generative rational behind *War Machine,* in considering what specifically critical interventions might resemble at a time when conventional academic responses appear hard-pressed to register the full breadth of wickedly intersecting and rapidly accelerating technical, political, and ecological dynamics. Overall, the consciously unconventional gesture at the heart of *War Machine* is an attempt at articulating a multiplicity of intra-acting phenomena that are effectively irreducible to any clear casual vectors, narratives, or "solutions" to the

critical problems they pose—to conduct a messy sounding of a kaleidoscopic environment whose incongruities are often confounding, unsettling, and sometimes absurd. In trying to represent these aspects, the goal is to bear out the matrix of challenging play, possibility, and uncertainty that such unruliness invites—to emphasise opportunities to tell myriad transient narratives that do not resolve into delimited analyses, maintaining an openness toward the curation of contingent resonances and vignettes that become kernels of always provisional insights or meaning, or indeed, by virtue of their strangeness, inspire further queries. These generative material and critical exchanges both contract and unfold the complexities of the present moment, and ultimately, in the face of their sometimes frightening implications, try to step back into the flux from which all art and storytelling arises, with human mark-making being predicted on a necessary kinship with our more-than-human registers of being-in-the-world, which both enable and influence what gets made and what gets told.

To rearticulate this point, we can acknowledge that even within the contexts of technologies and practices that seem inimical to such, there always remain opportunities for modes of reading and modes of action that recognize how, at the scales and durations of Earthly existence, meaning is established by, and propagates through our entanglements with more-than-human agencies. Art and storytelling do not simply furnish passive depictions of our current conditions, but always manifest as concrete interventions within them, carrying significance beyond human understandings alone. The pursuit of these practices represent another kind of a dialogue with the Earth,

very different to that conducted by military-industrial technoscience or even conventional scholarship, and which has the particular power of fostering a continuing openness to alternative modes of knowing and being that can otherwise be elided by prevailing technical and analytical orthodoxies. This does of course require a willingness to actually conduct such work, rather than only calling for such, and while individual efforts do not inherently translate into a fundamentally changed world, they are nevertheless a vital contributor to the conditions in which such endeavours can be deemed possible at all, fostering new imaginaries and new meanings in the face of forbidding futures.

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Each diptych in *War Machine* can be explored in any order desired by the reader. Below each map is a short caption that states the name of the IUCN ecosystem it depicts, along with the specific TPC chart reference. The charts themselves were sourced from the open access Perry-Castañeda Library Map Collection at the University of Texas at Austin. Many of these charts are 1980s or 1990s vintage, and sometimes depict places, names, and even ecosystems that no longer exist.

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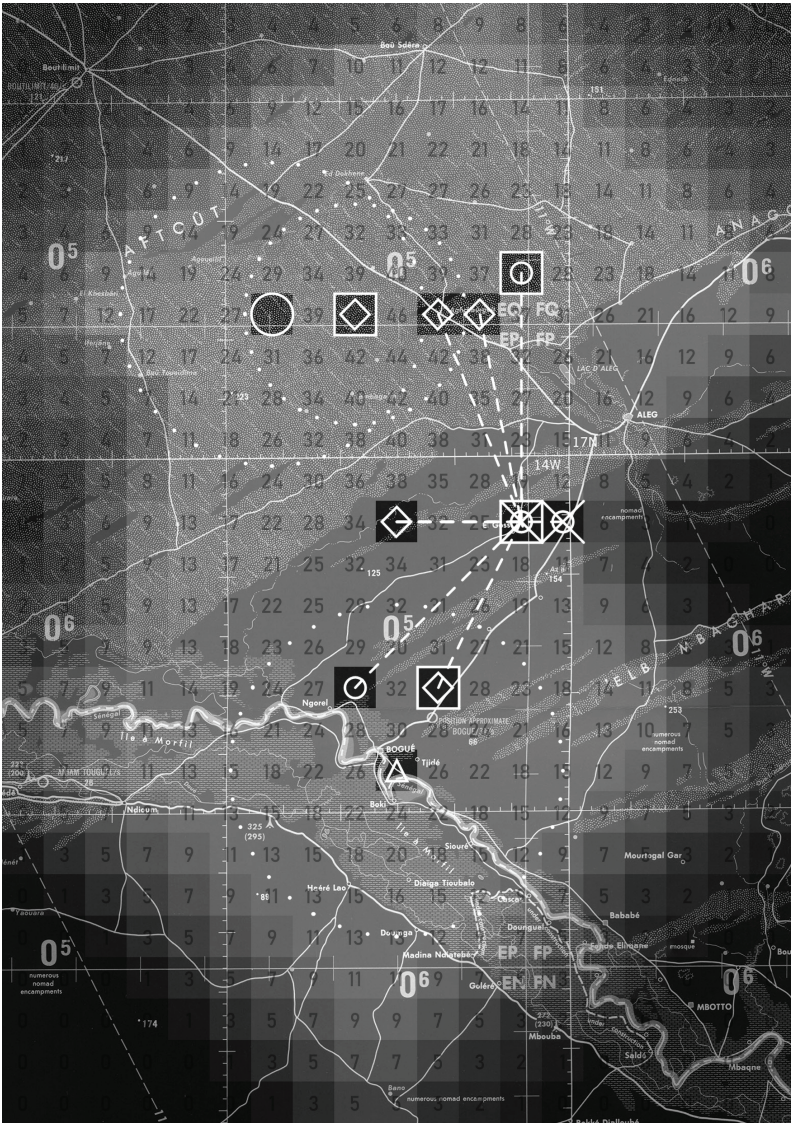
PLATES



Gonakier Forests of Senegal River Floodplain, TPC J-1C

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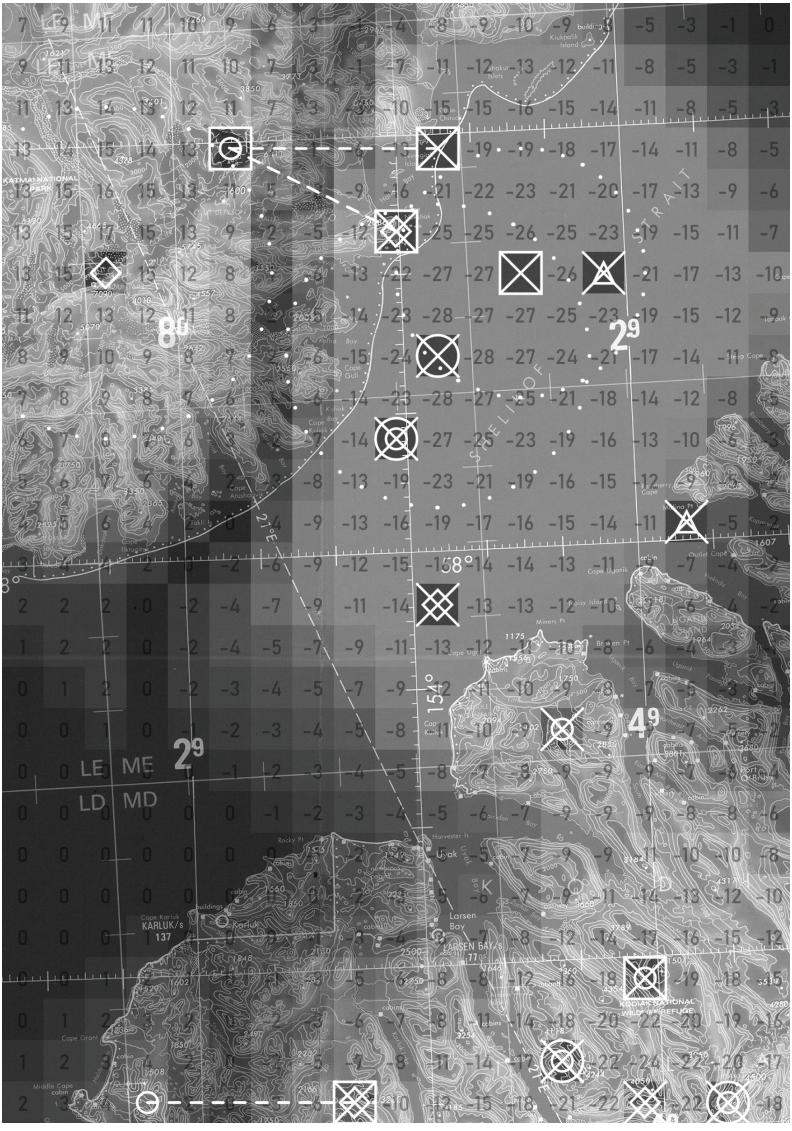
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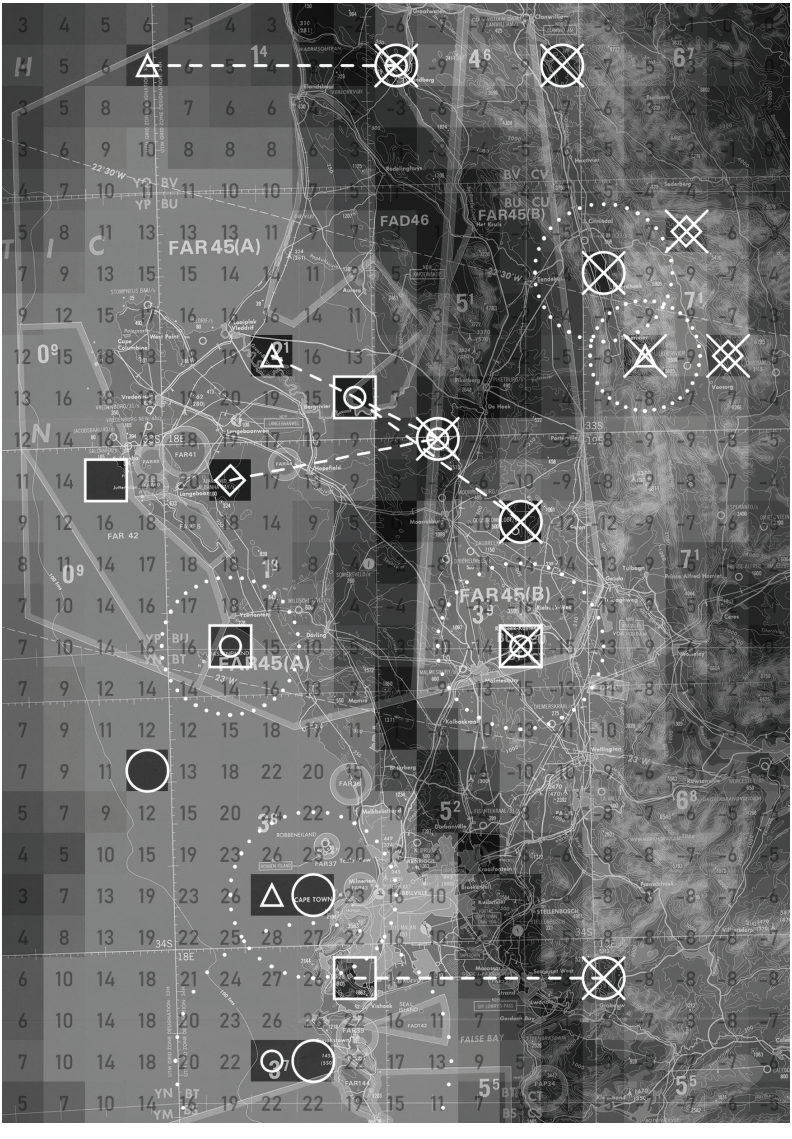

Cape Flats Sand Fynbos, TPC R-4A

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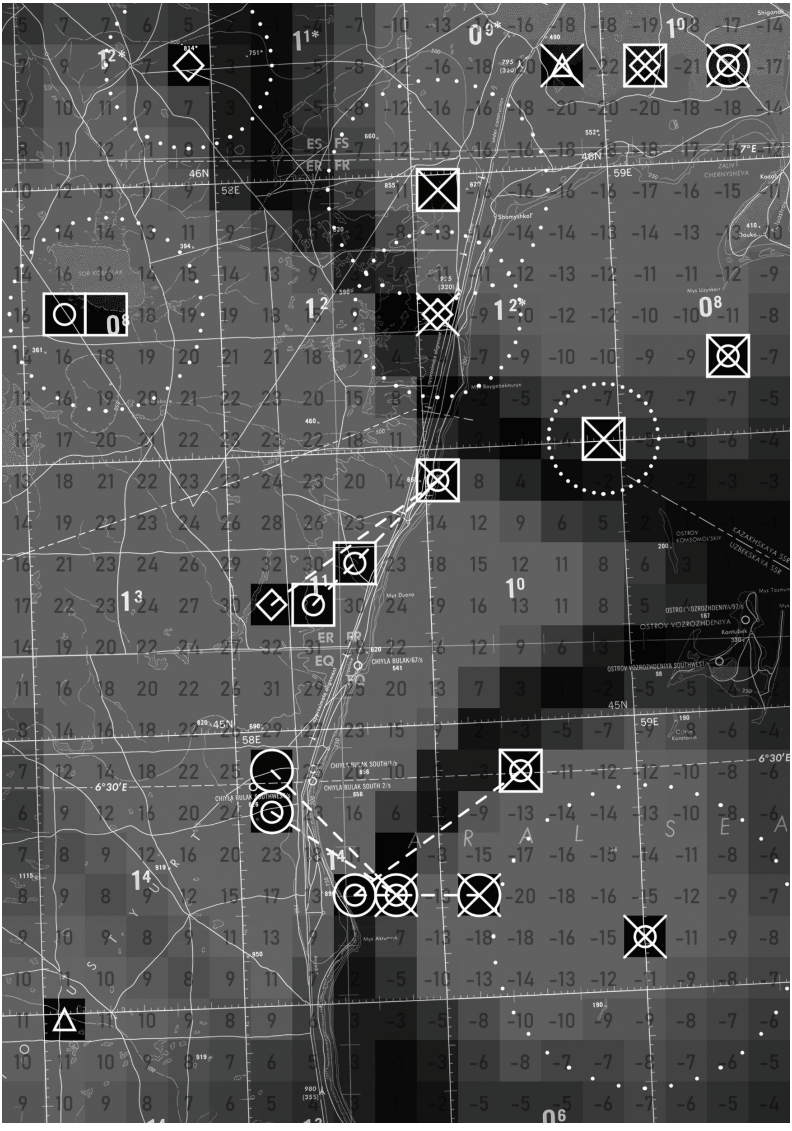

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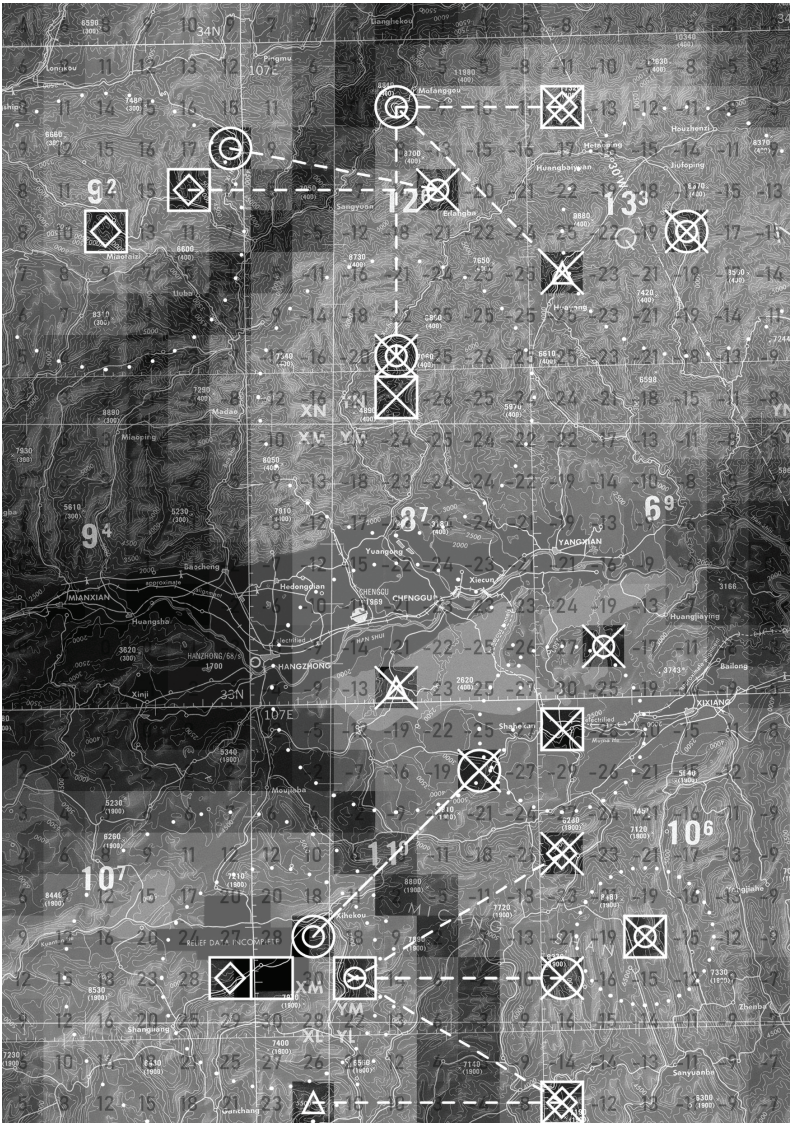

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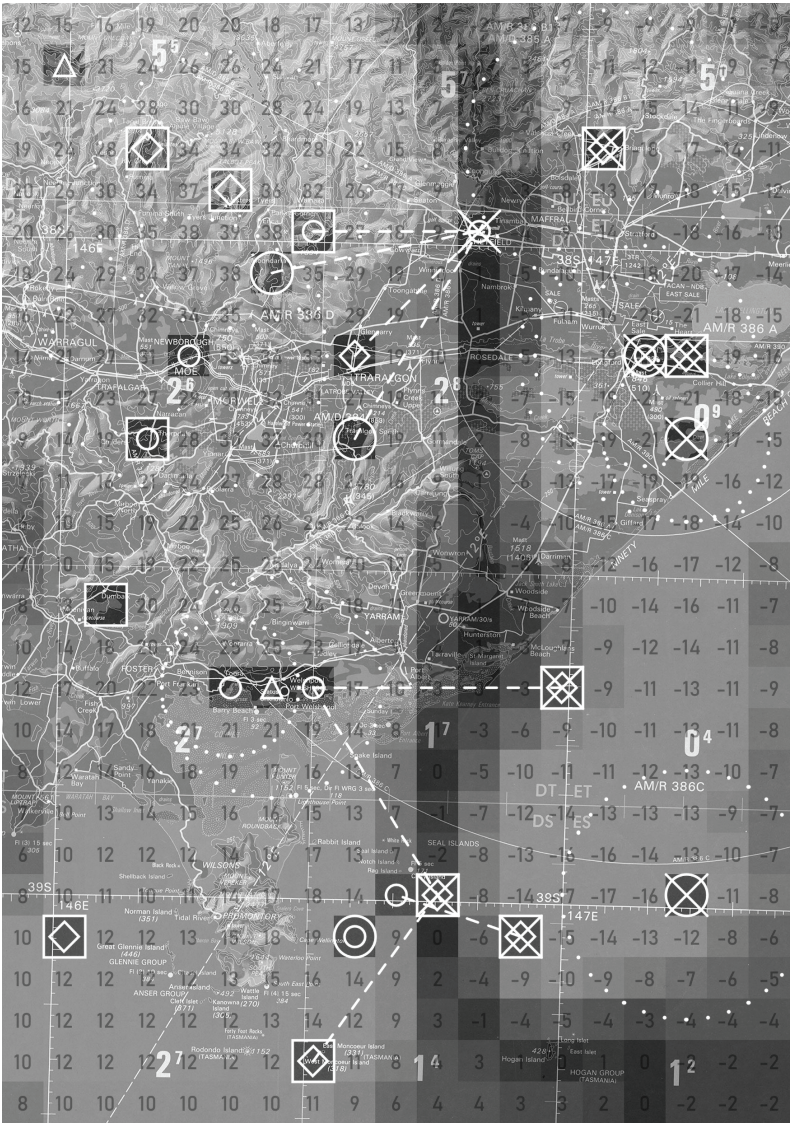

Mountain Ash Forest, TPC R-13D

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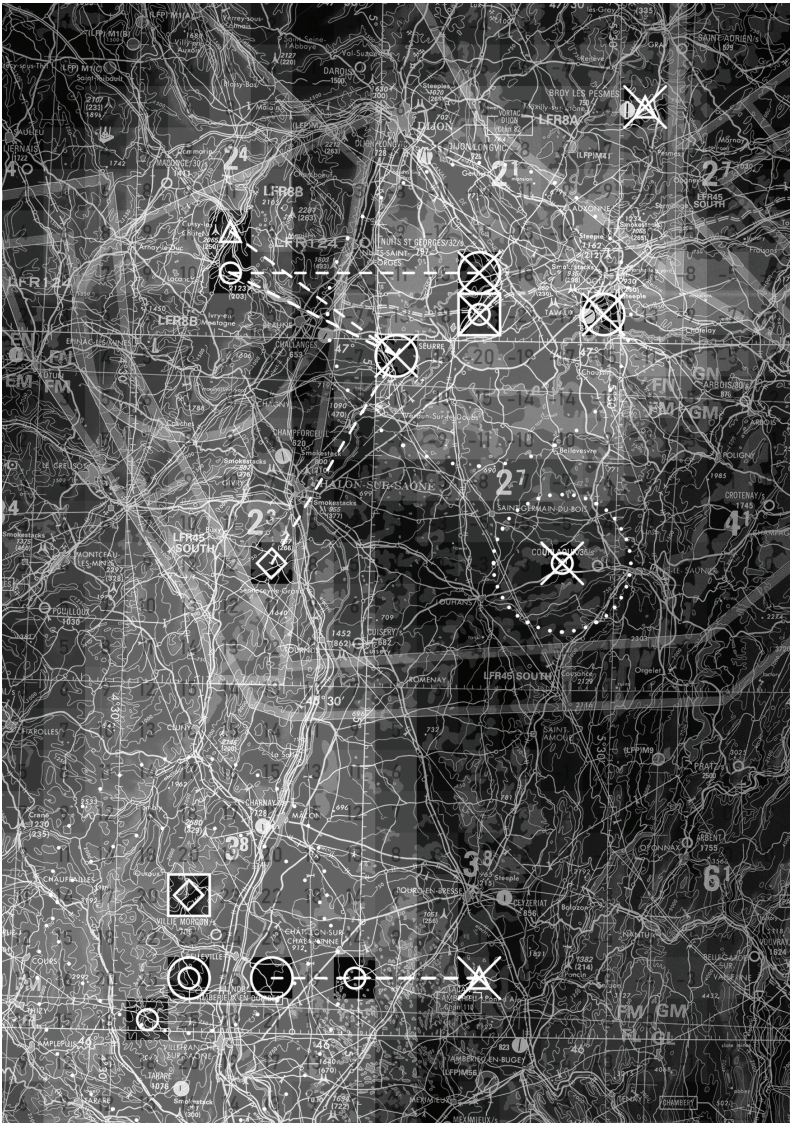

German Tamarisk-Pioneer Vegetation, TPC F-2A

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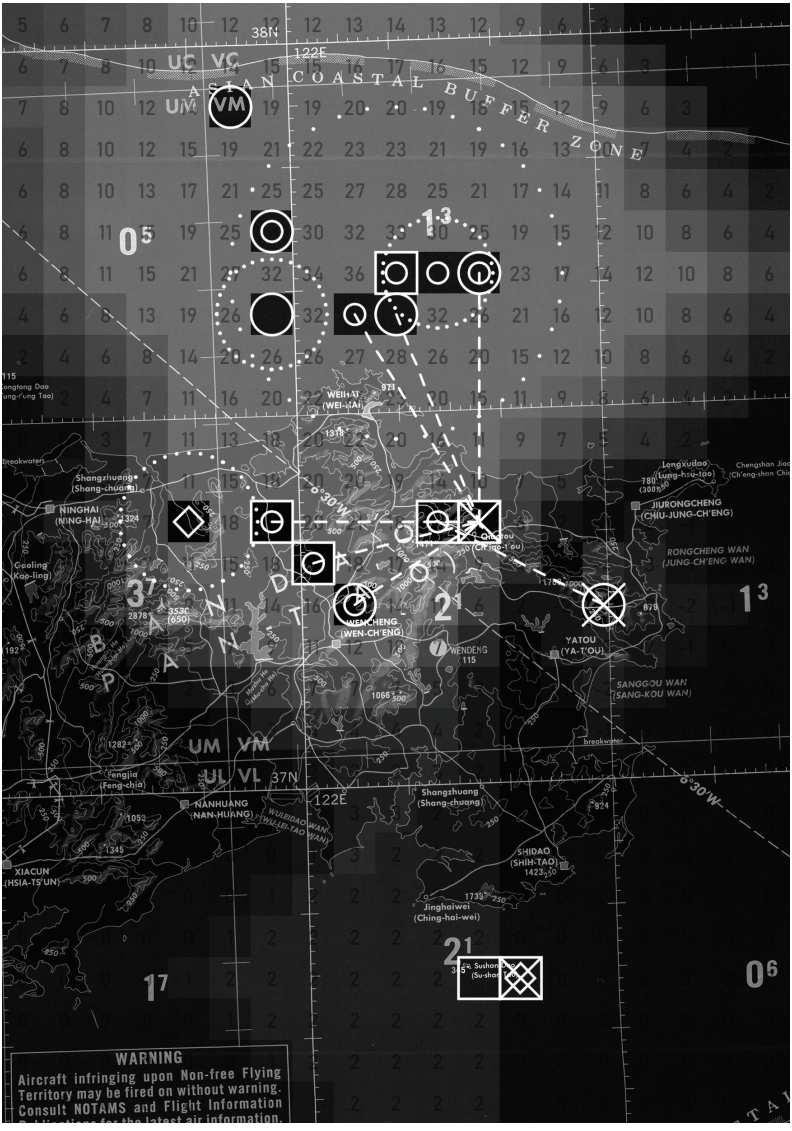

Tidal Flats of the Yellow Sea, TPC G-10A

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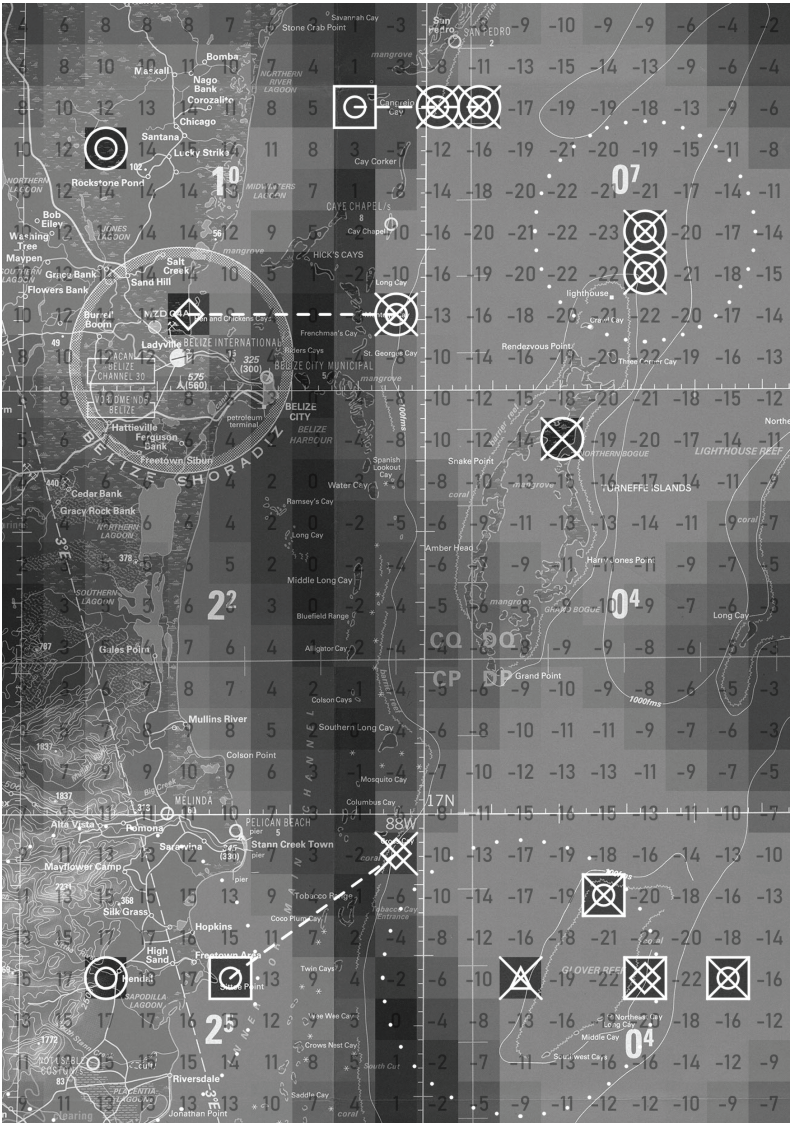

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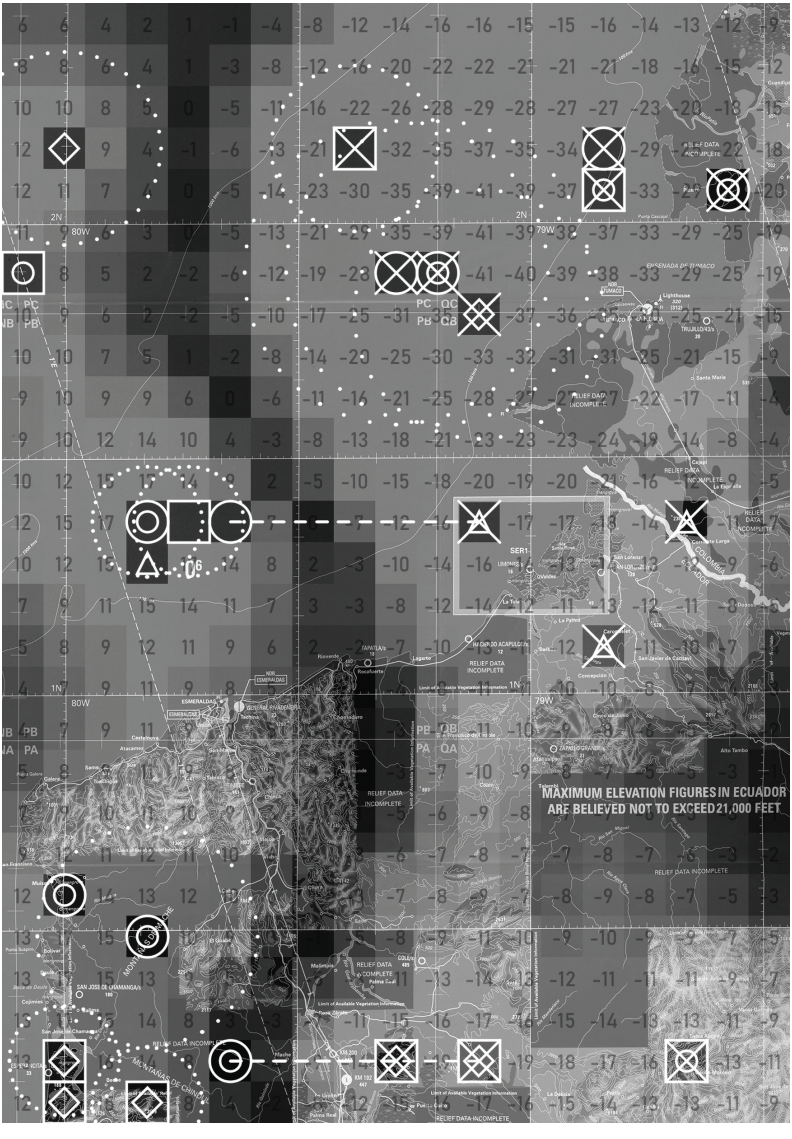

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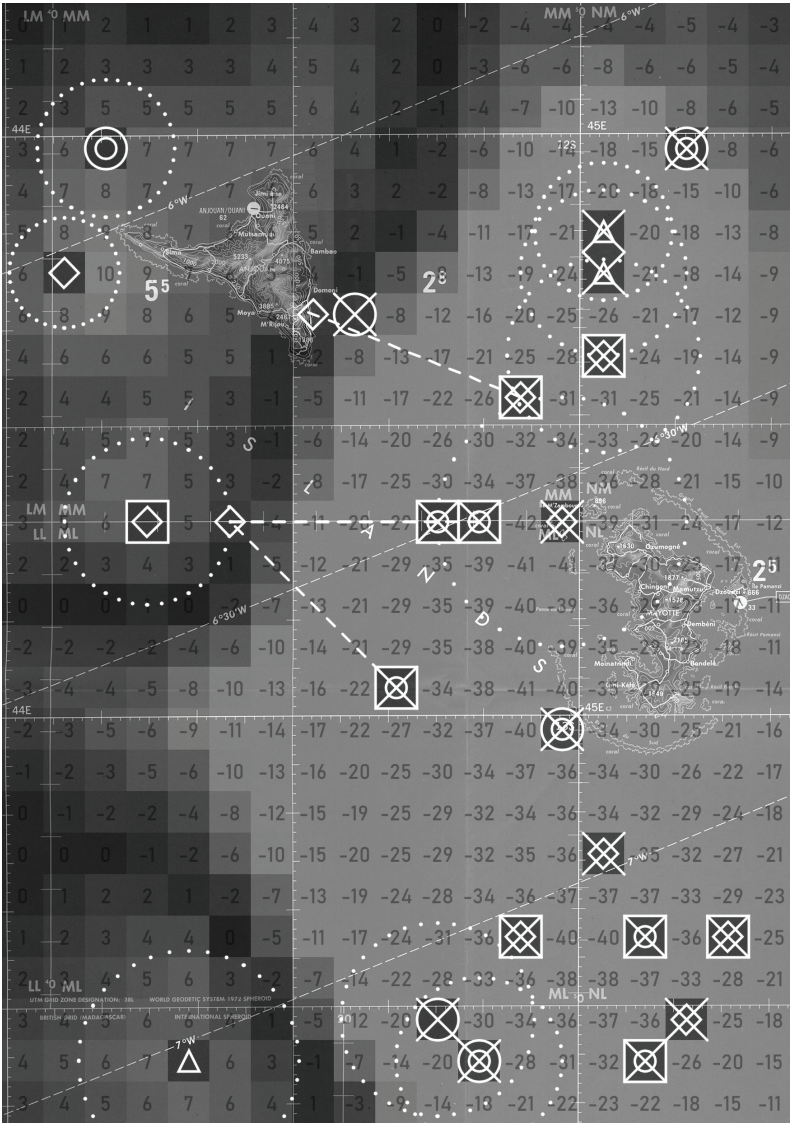
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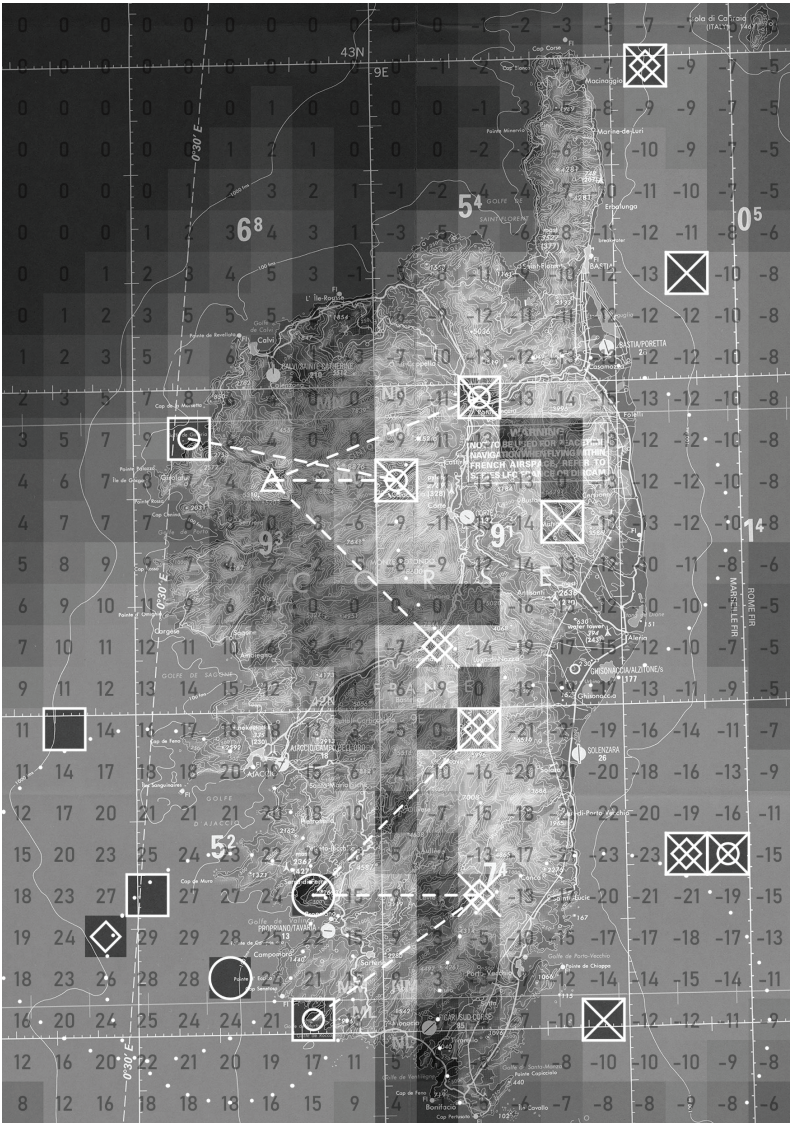

Nerium, Chaste Tree and Tamarisk Gallery Forests, TPC F-2D

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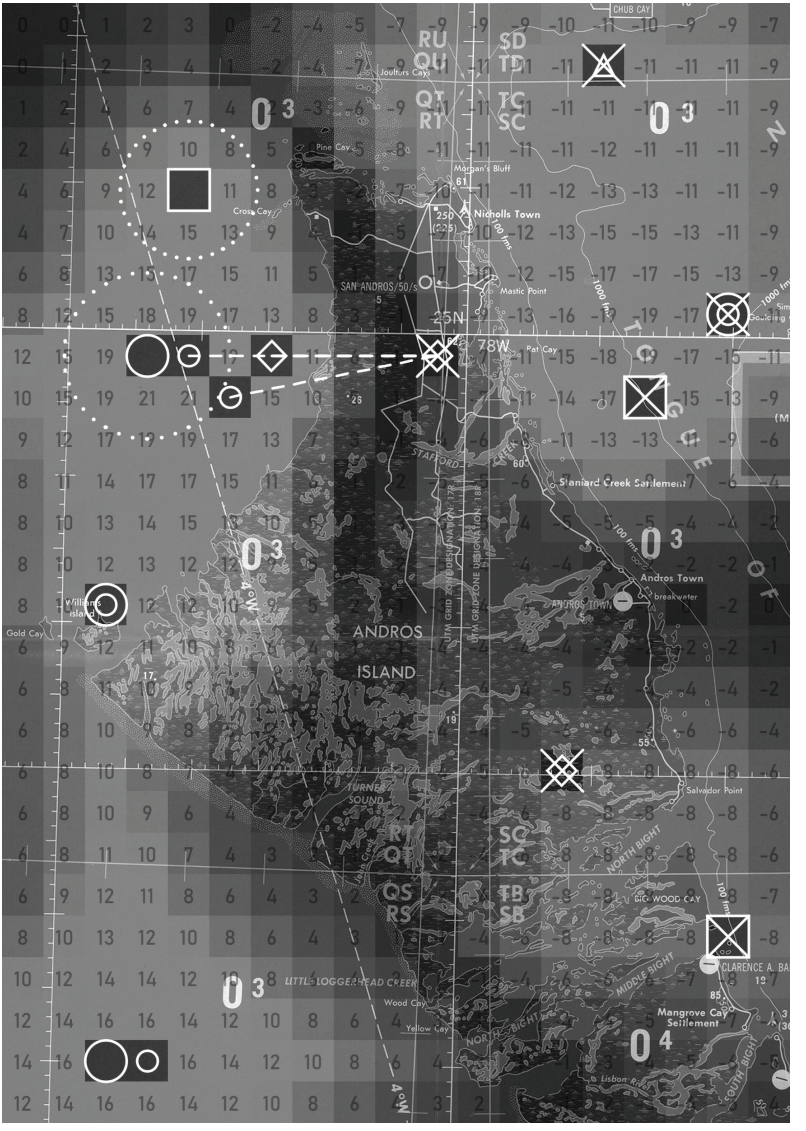

Caribbean Coastal Lowland Dry Forest, TPC H-25C

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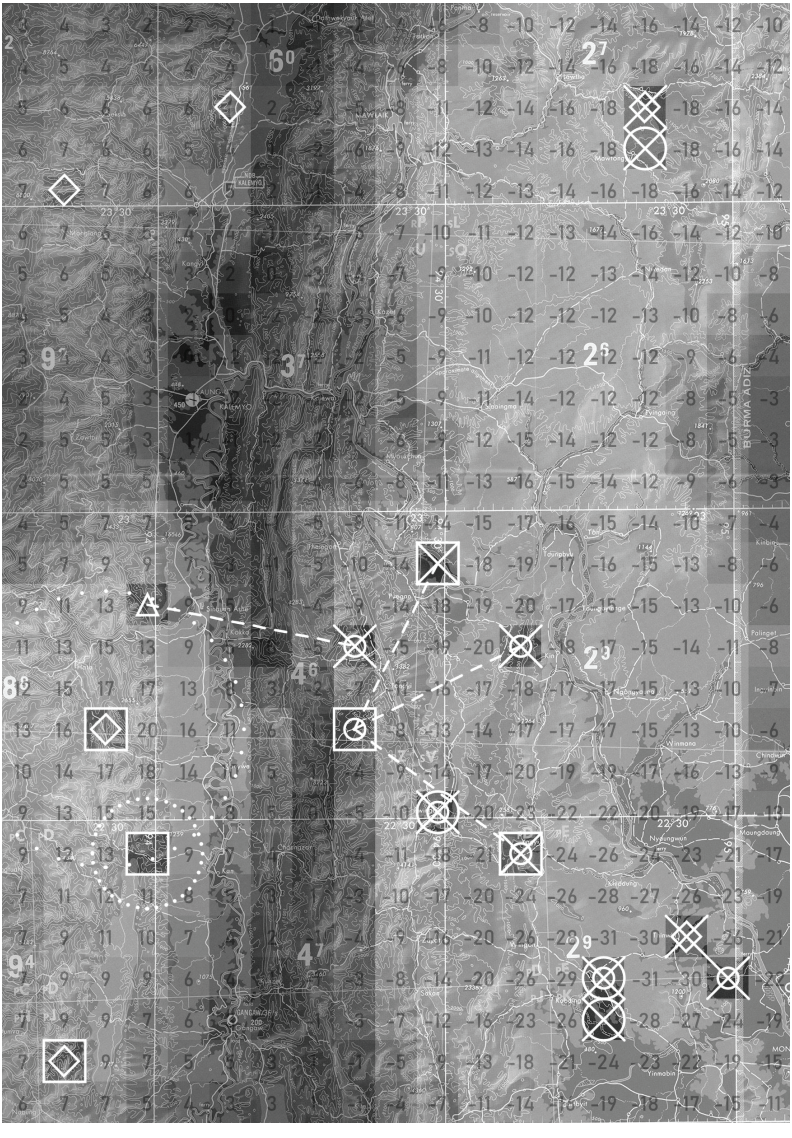

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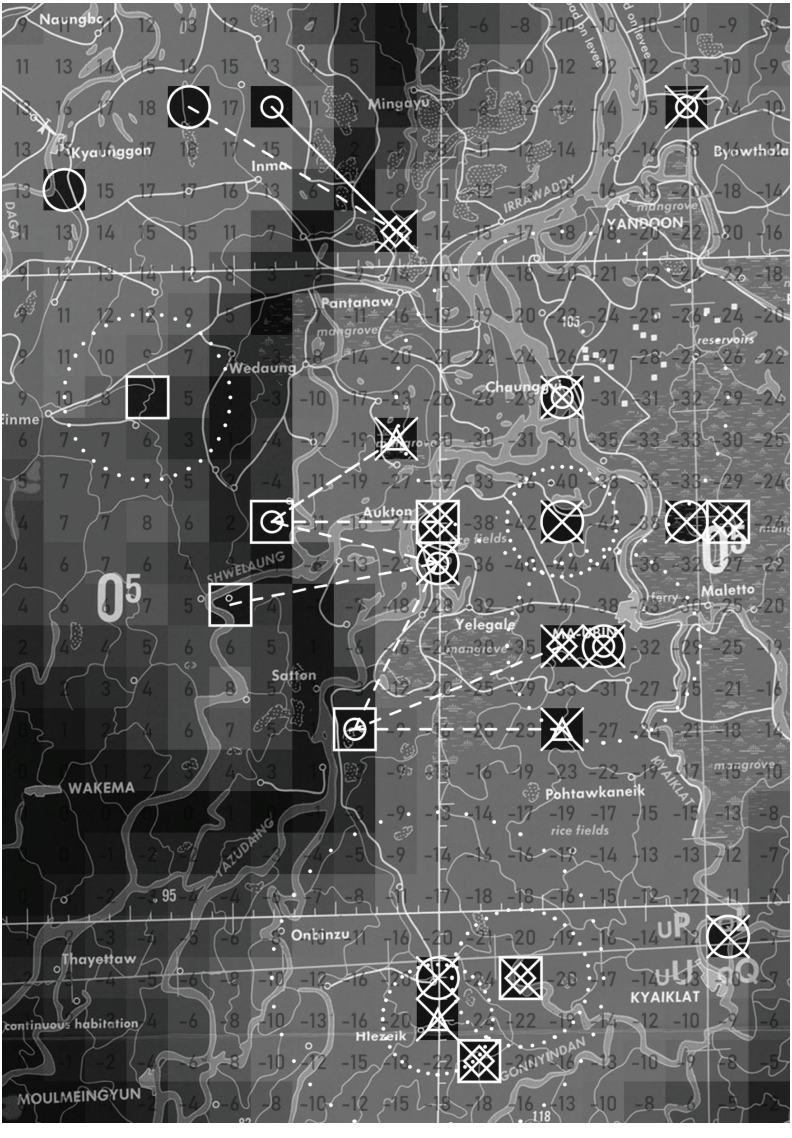

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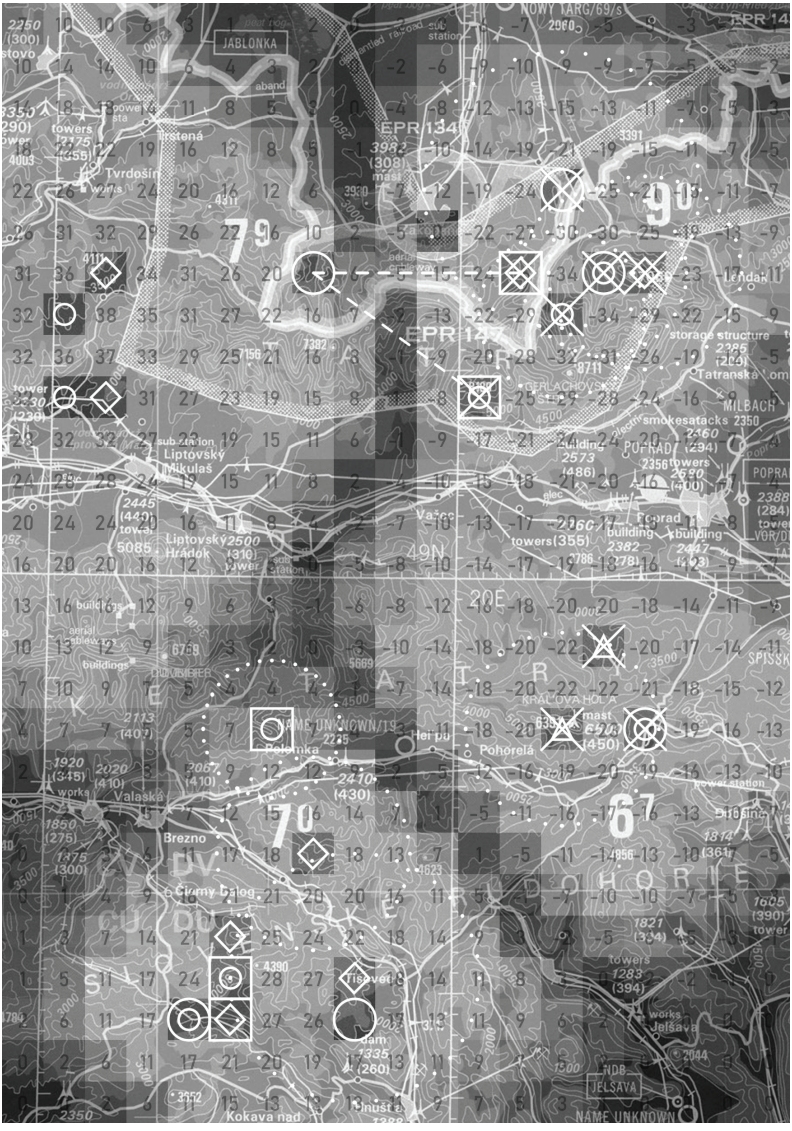

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Chesapeake Bay, TPC G-21B

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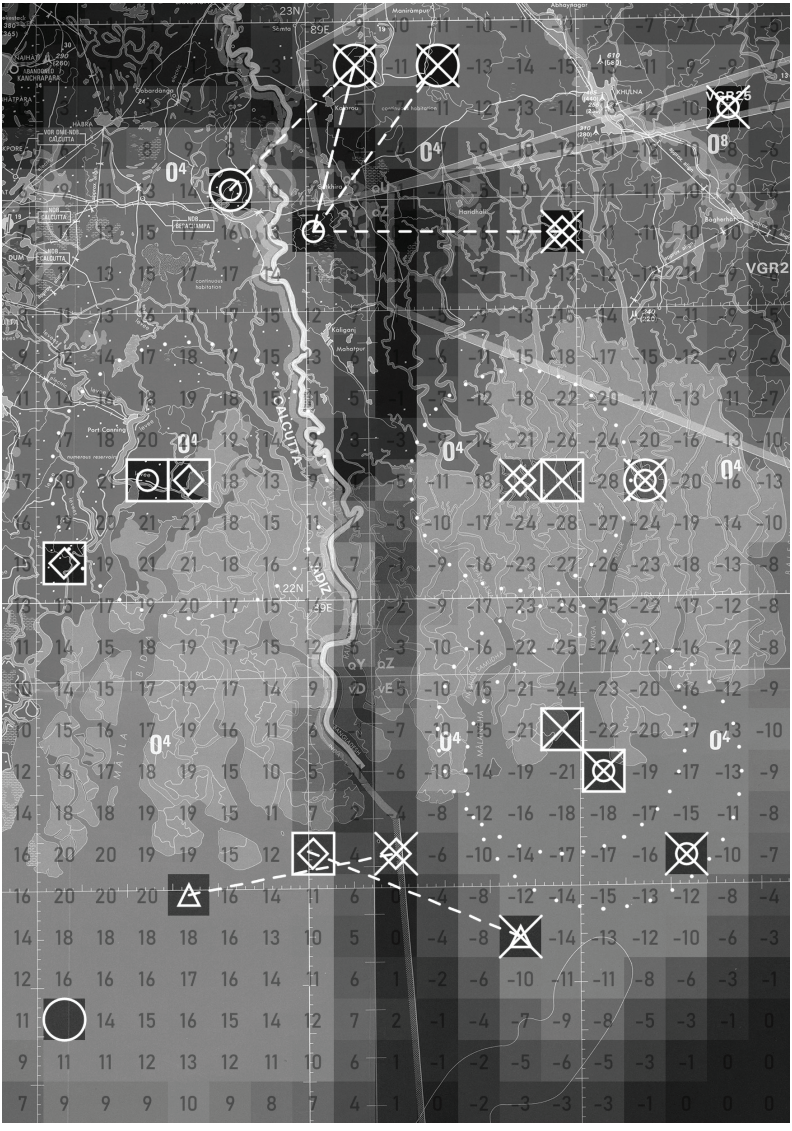
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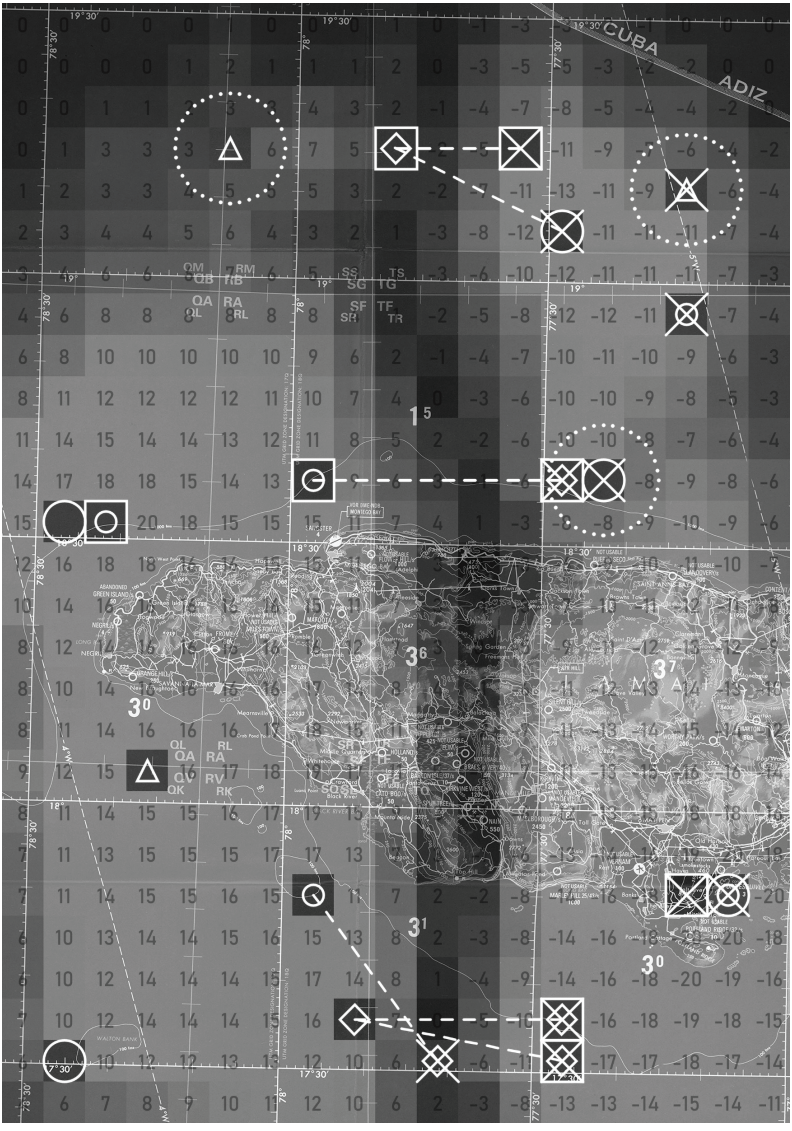

Caribbean Dry Limestone Forest, TPC J-26C

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Caribbean and Mesoamerican Seasonal Dry Forest, TPC J-25B

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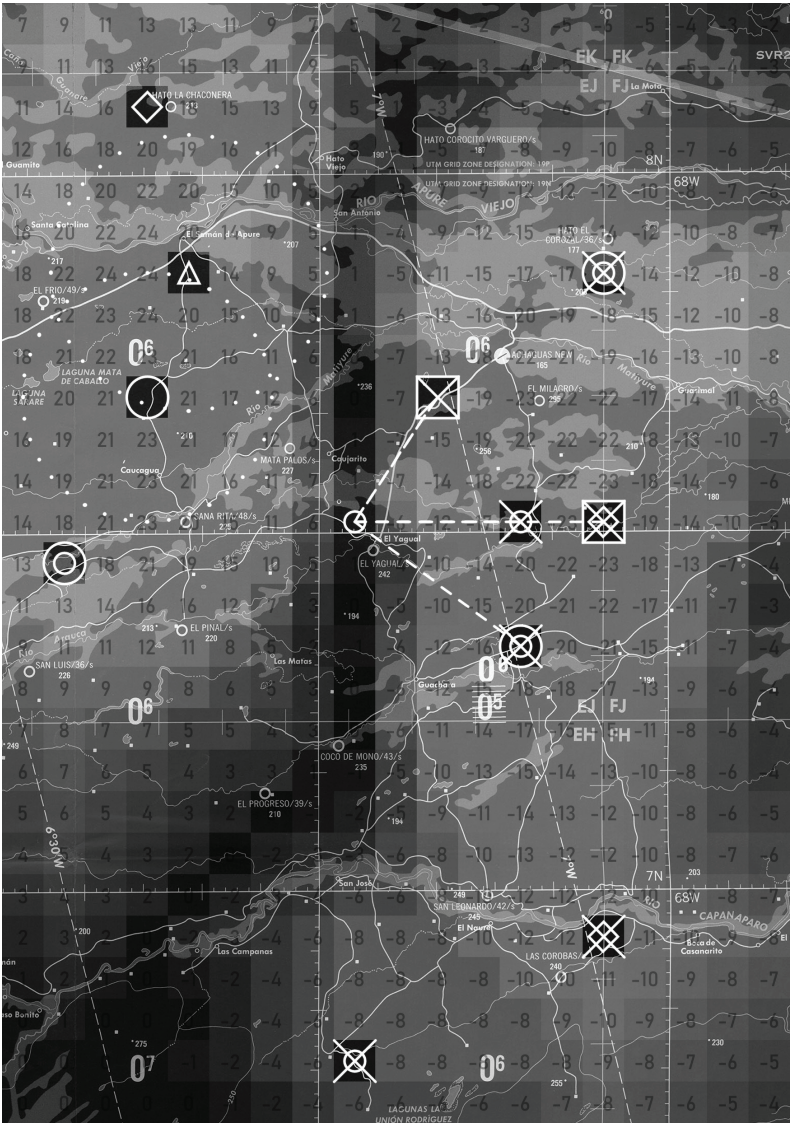

Llanos Seasonal Dry Forest, TPC K-27C

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Sand Pioneer Community Ecosystem, TPC F-9A

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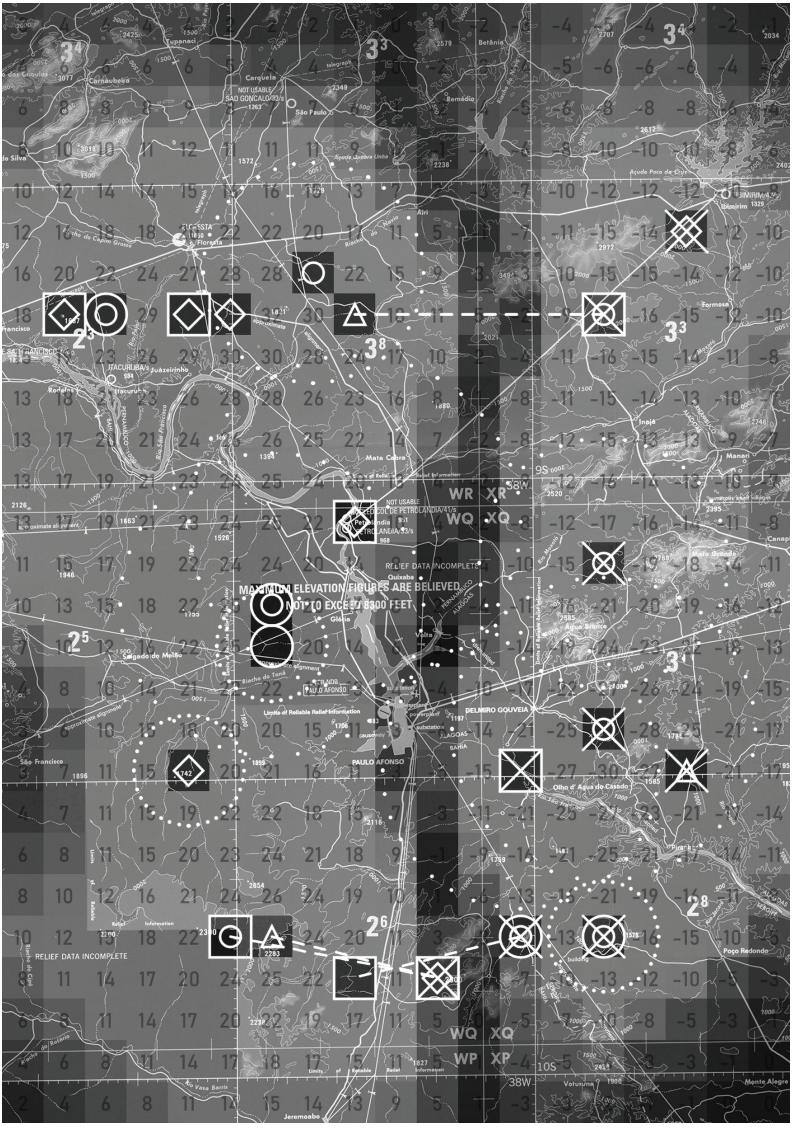

Caatinga Seasonal Dry Forest, TPC N-28B

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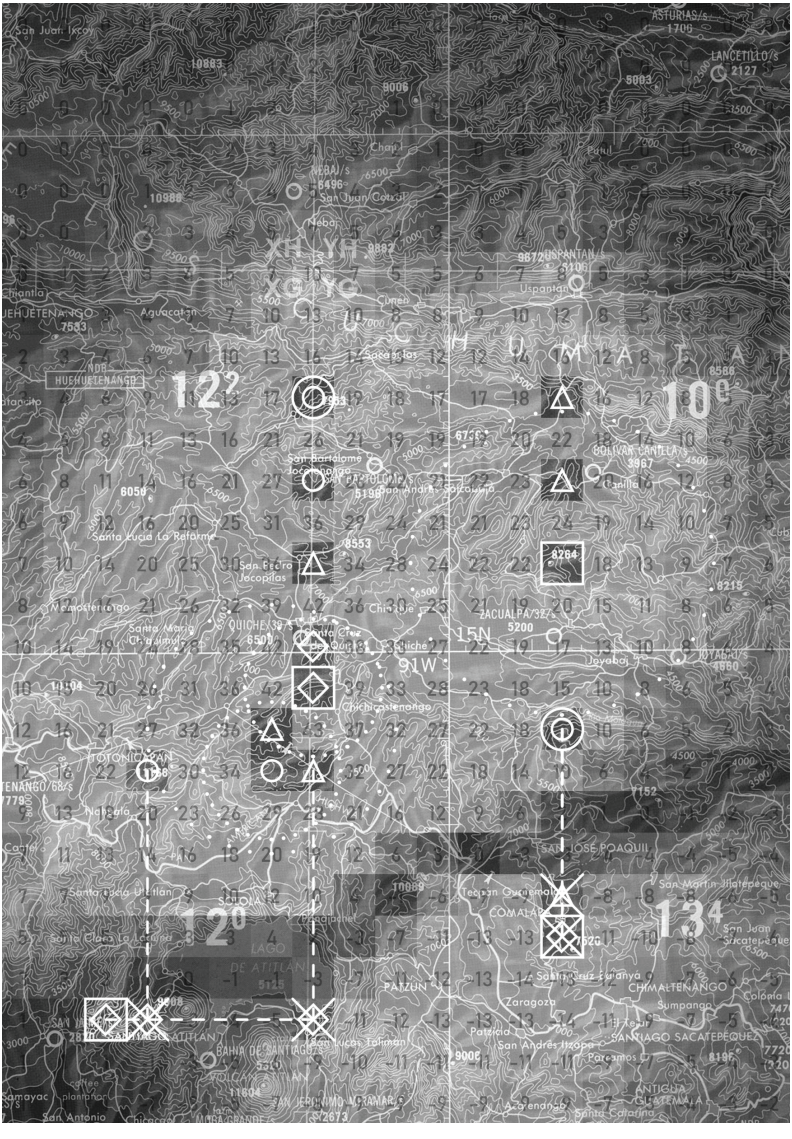

Mesoamerican Submontane Humid Forest, TPC K-25A

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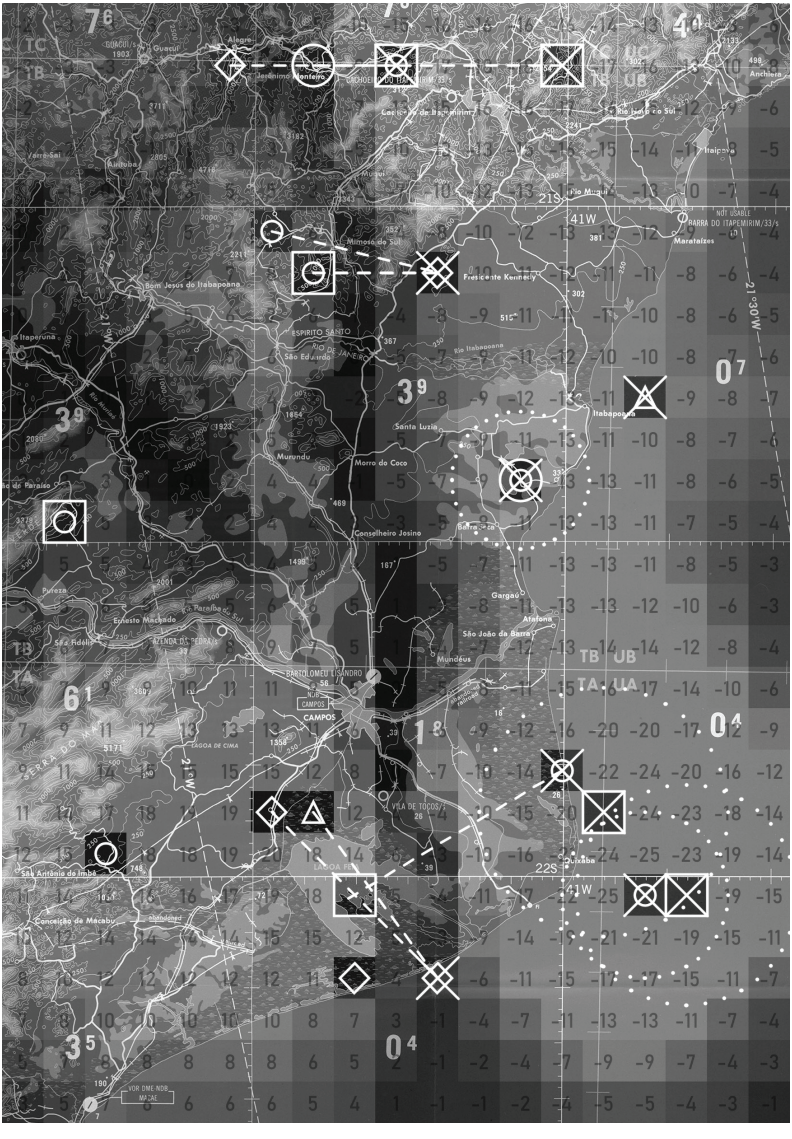
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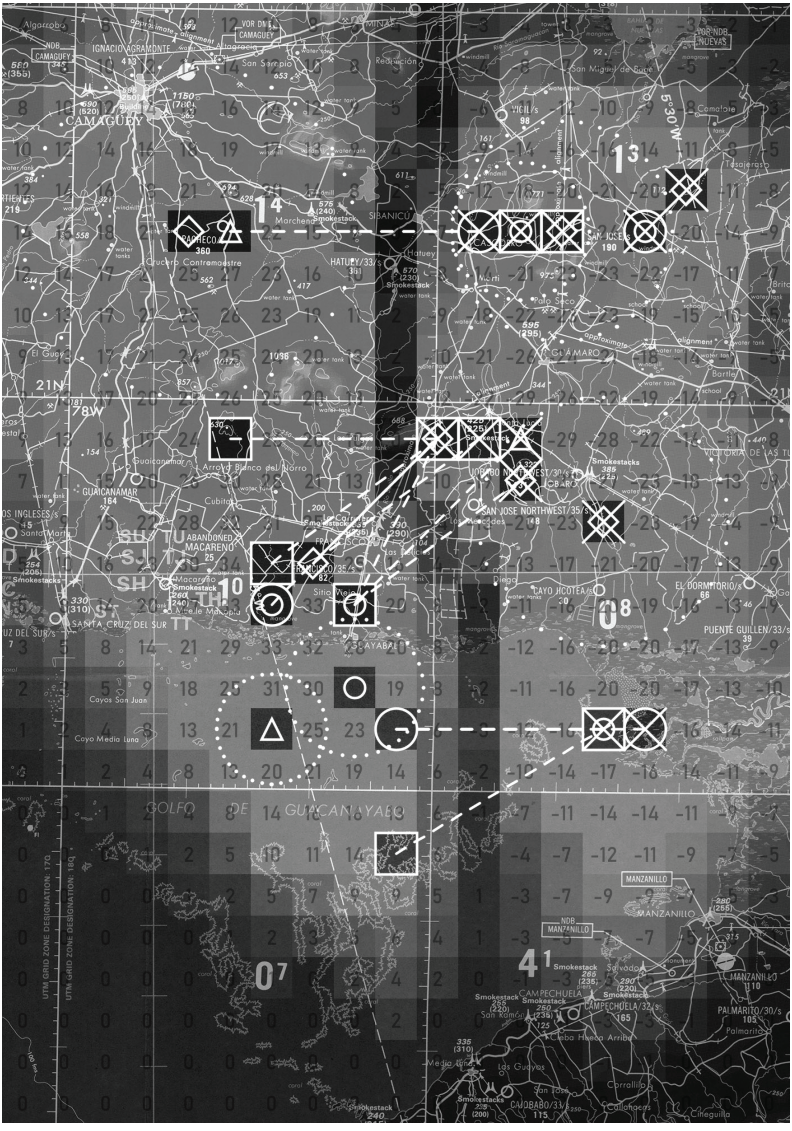

Caribbean Swamp, TPC K-9C

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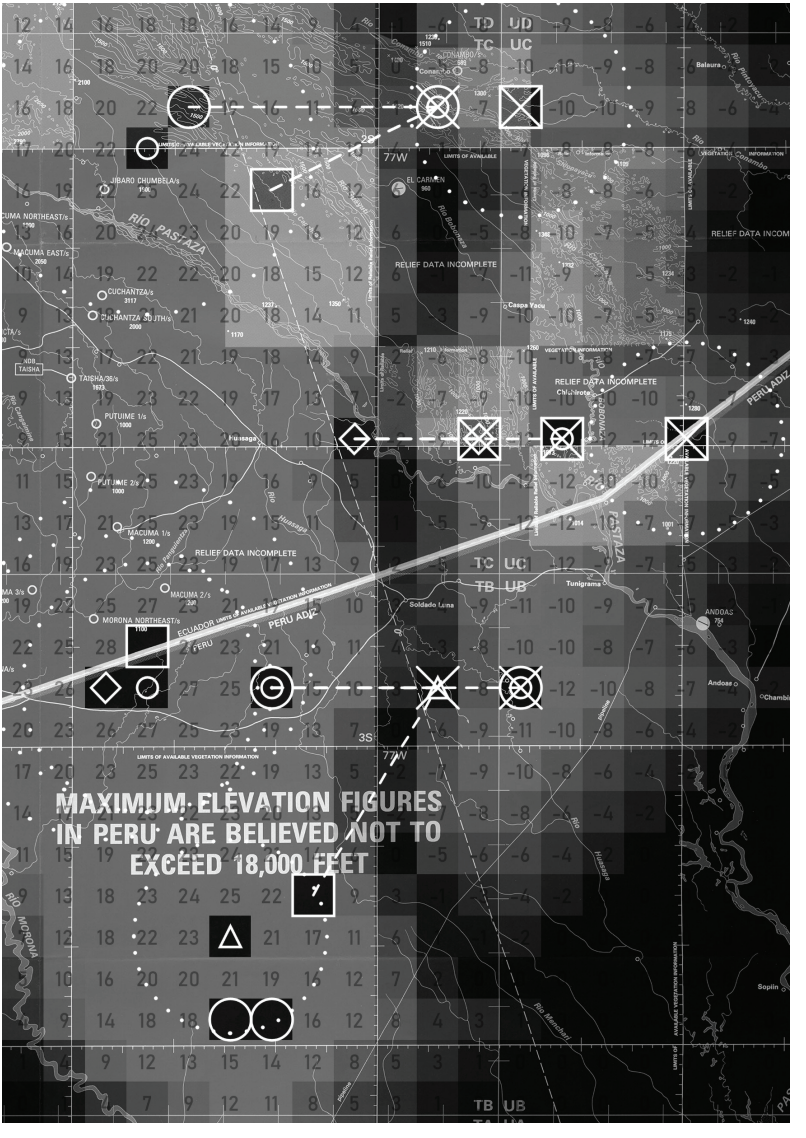

Western Amazon Floodplain Forest, TPC M-25A

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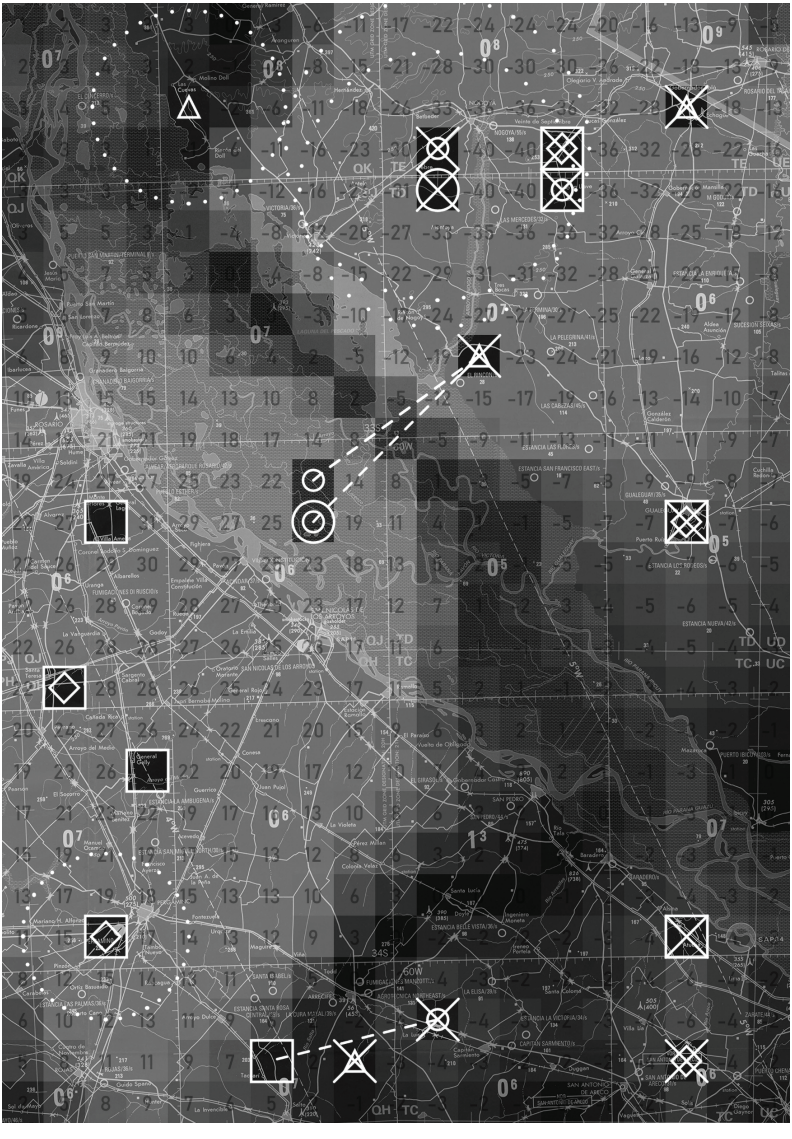

Parana Floodplain Forest, TPC R-24A

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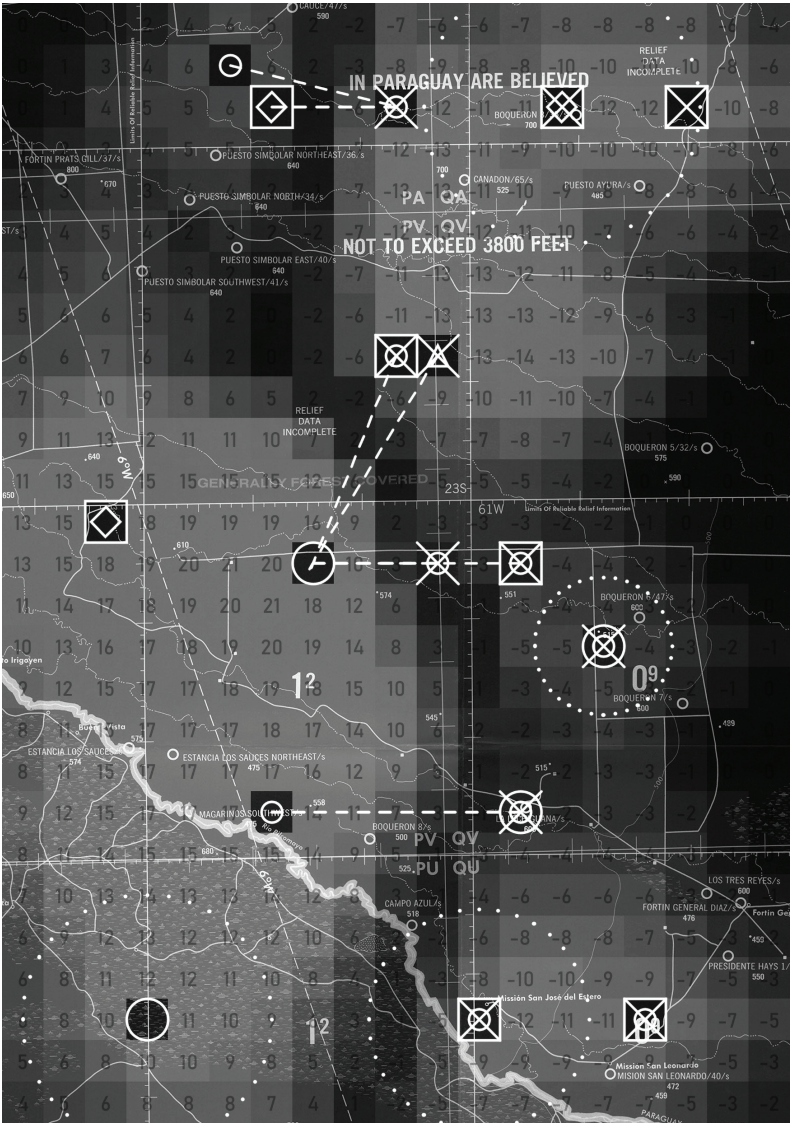

Northern Chaco Floodplain Forest and Woodland, TPC P-27D

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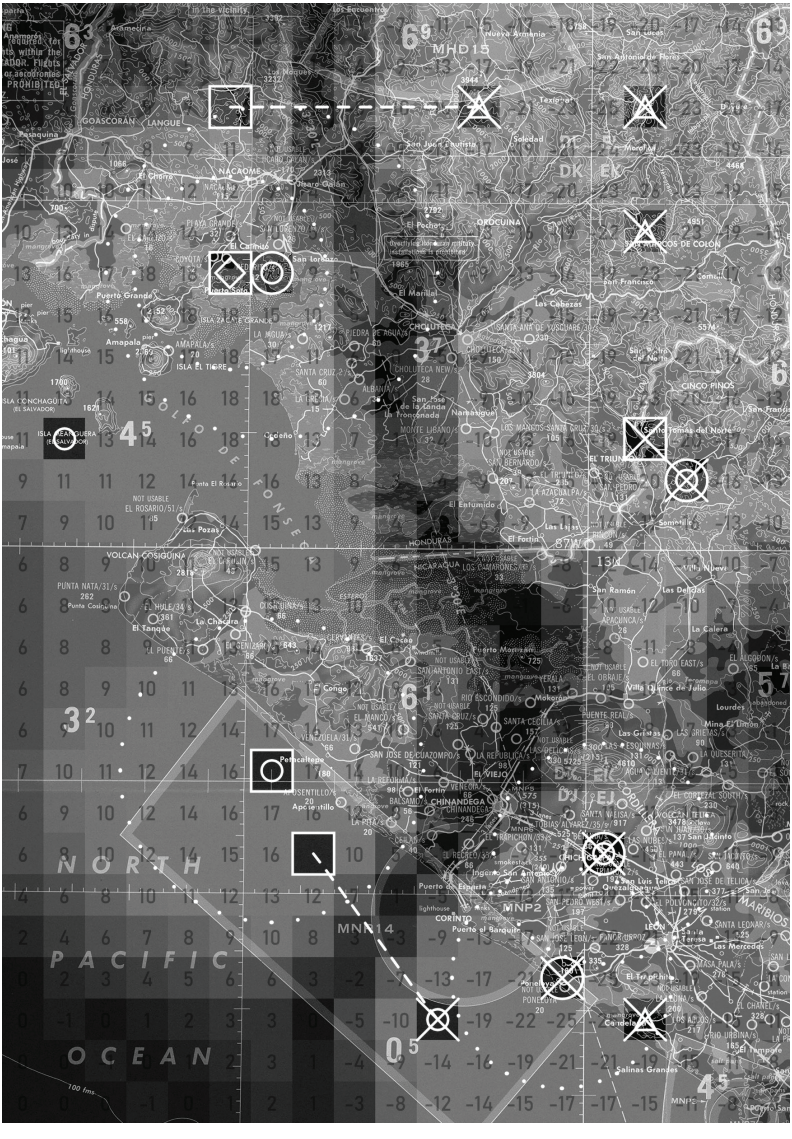
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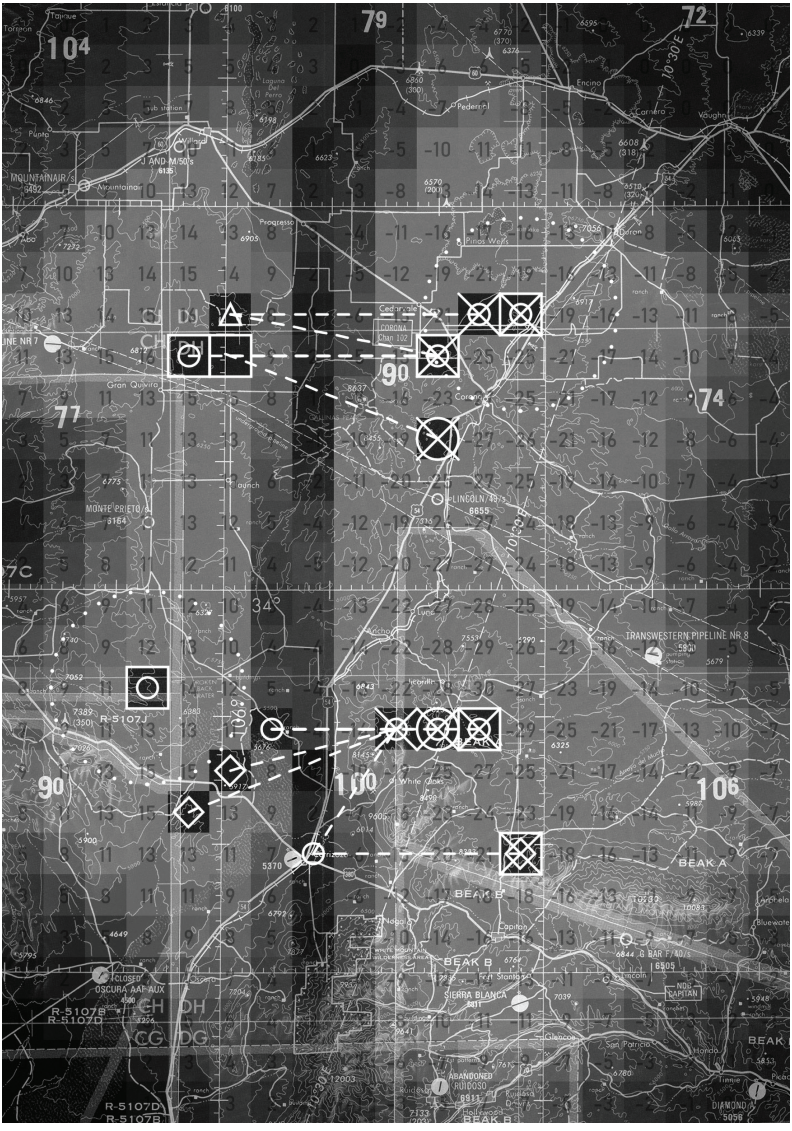

Southern Rocky Mountain Two-needle Pinyon - One-seed Juniper Woodland, TPC G-19C

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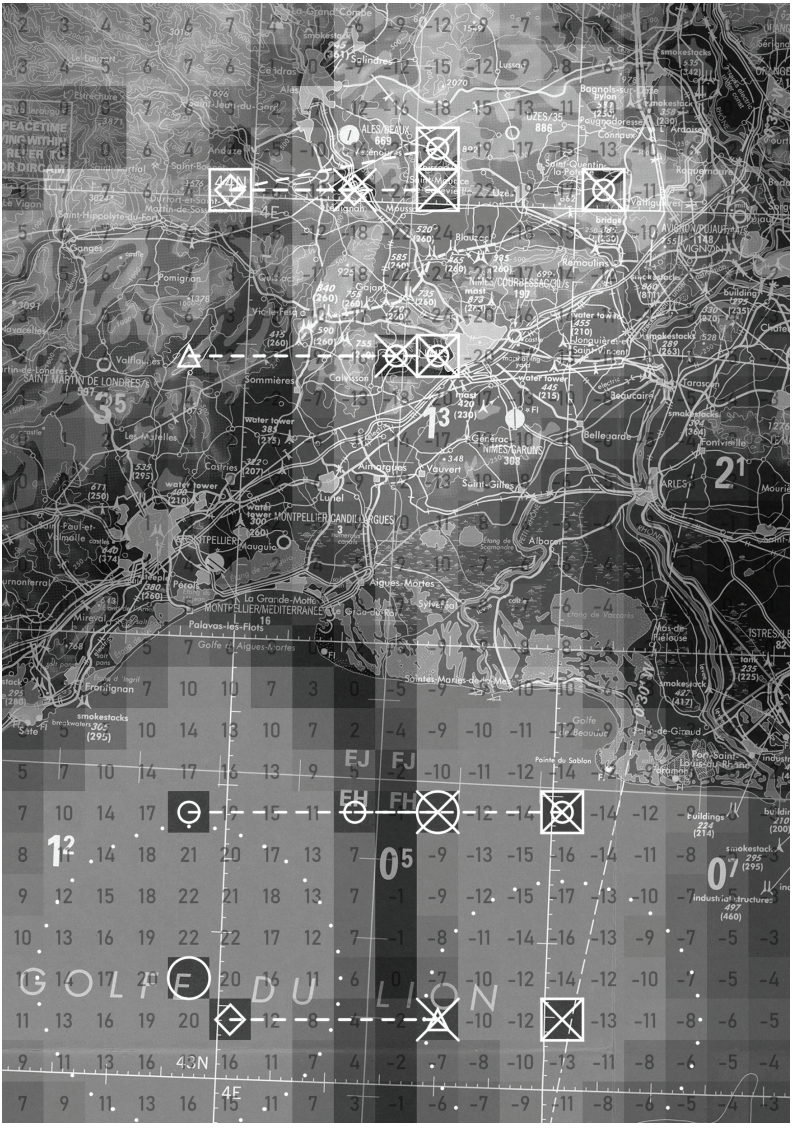

Mediterranean Wooded Dunes, TPC F-2D

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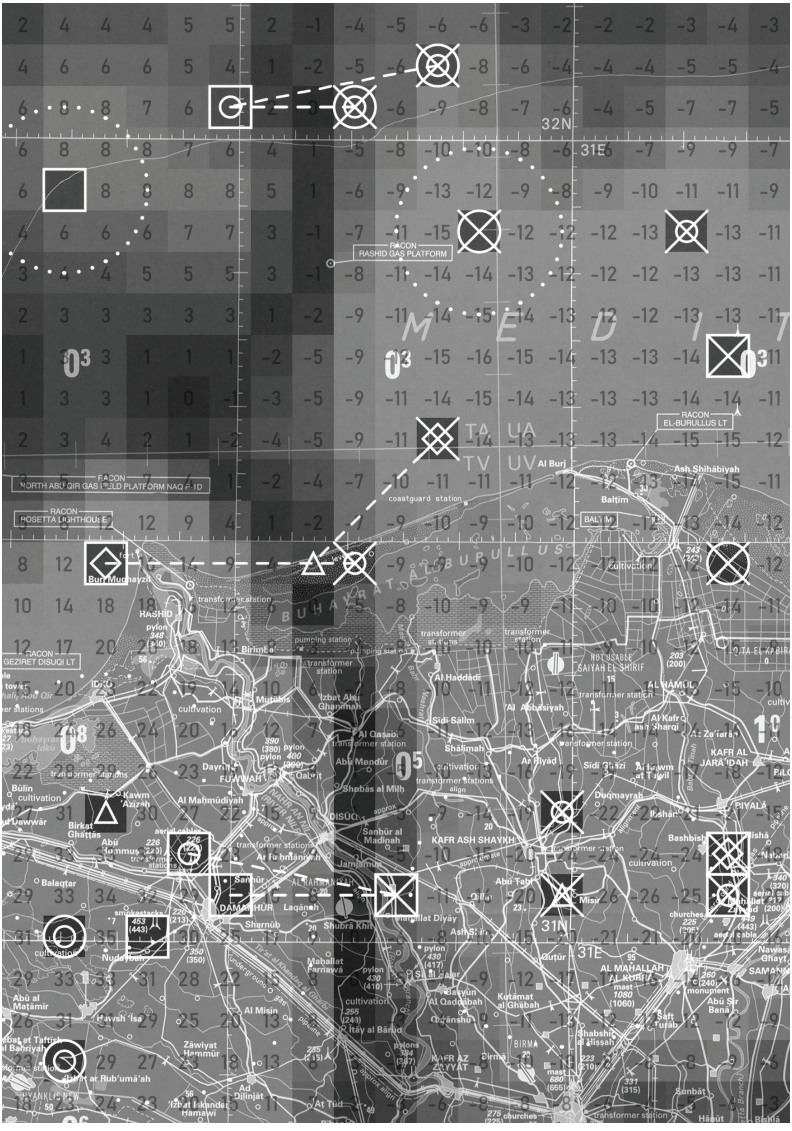

Sand Plain of the Lake Burullu, TPC H-5A

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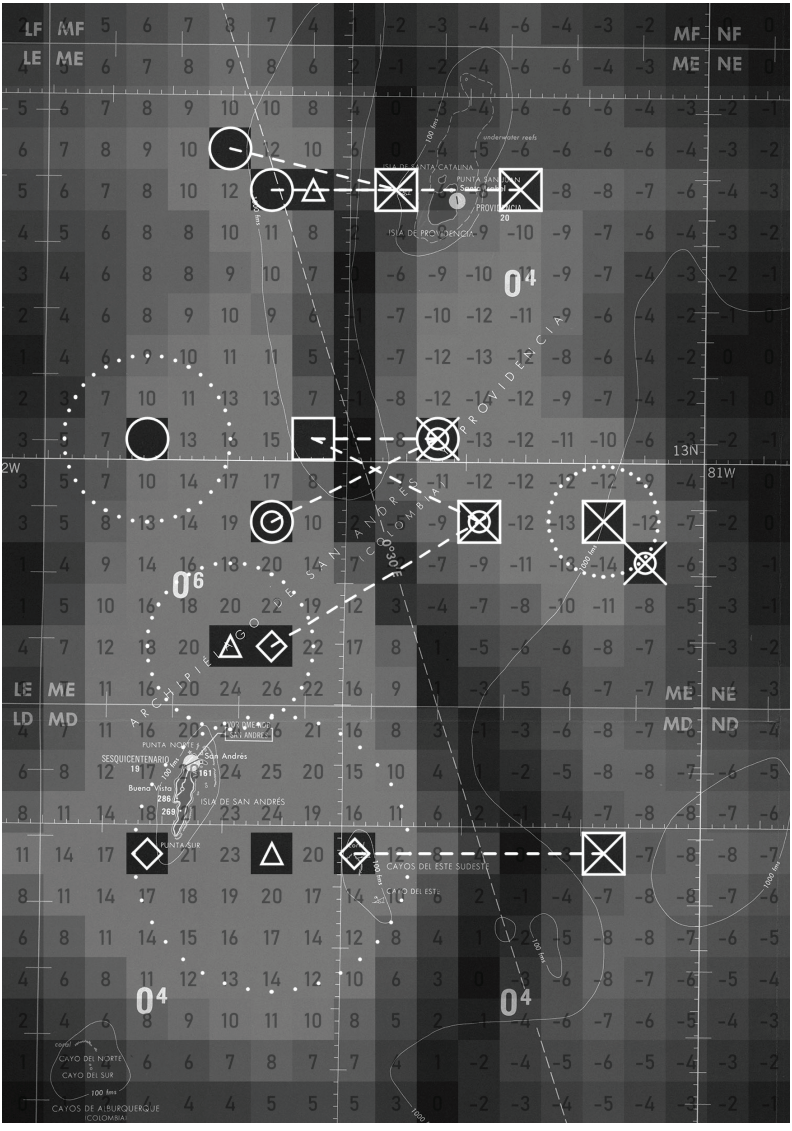

Oceanic Caribbean Sandy Beaches, TPC K-26A

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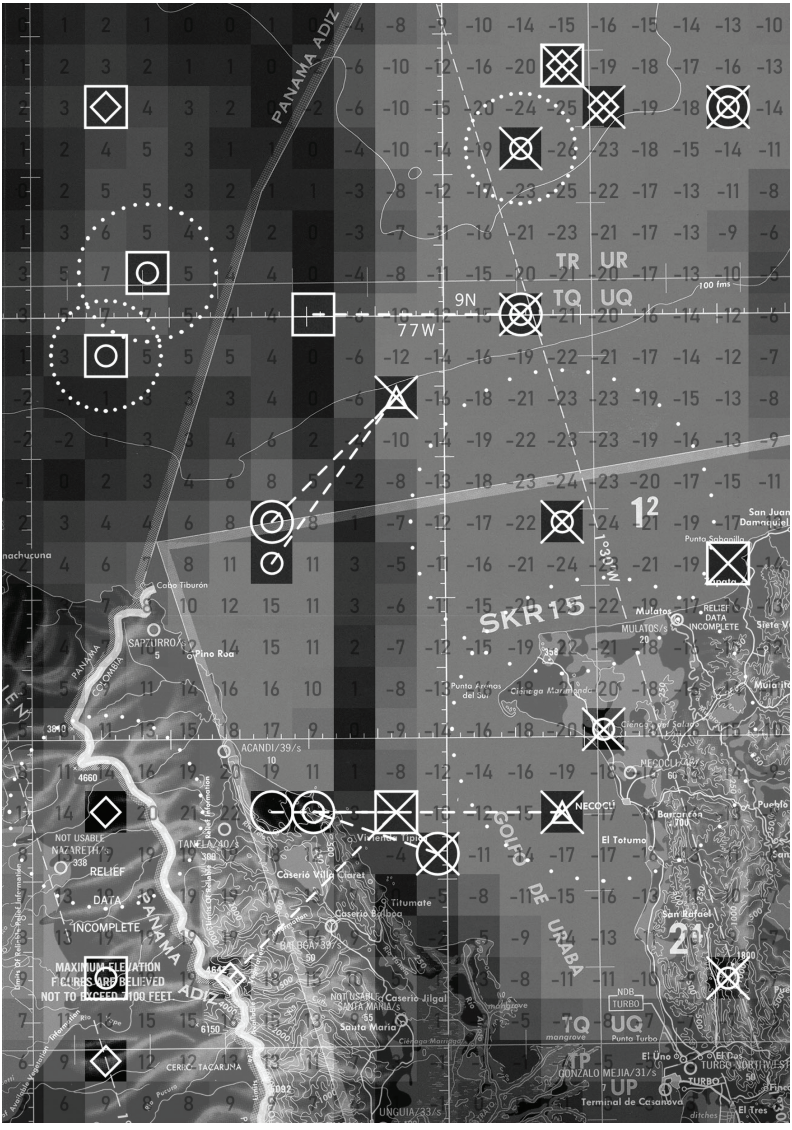

Continental Caribbean Cohesive Rocky Shorelines, TPC K-26D

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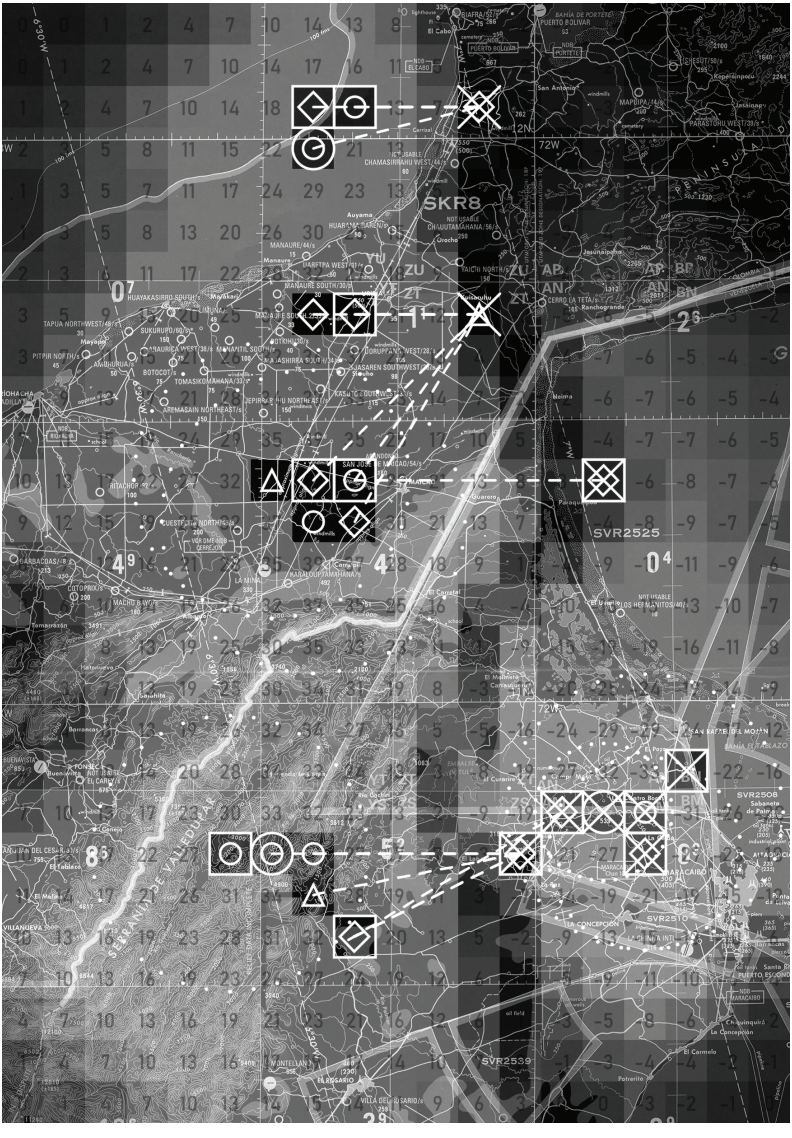

Continental Caribbean Seagrass Meadows, TPC K-26C

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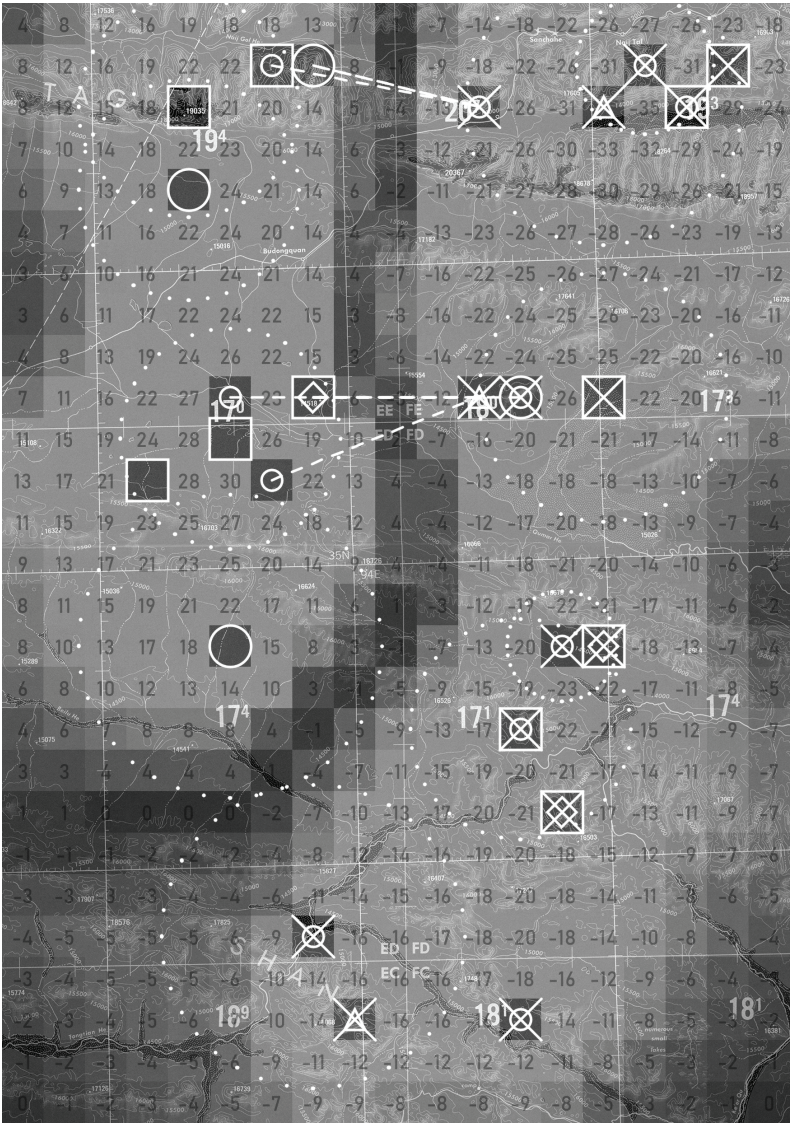

Juniperus Komarovii Forest, TPC G-8D

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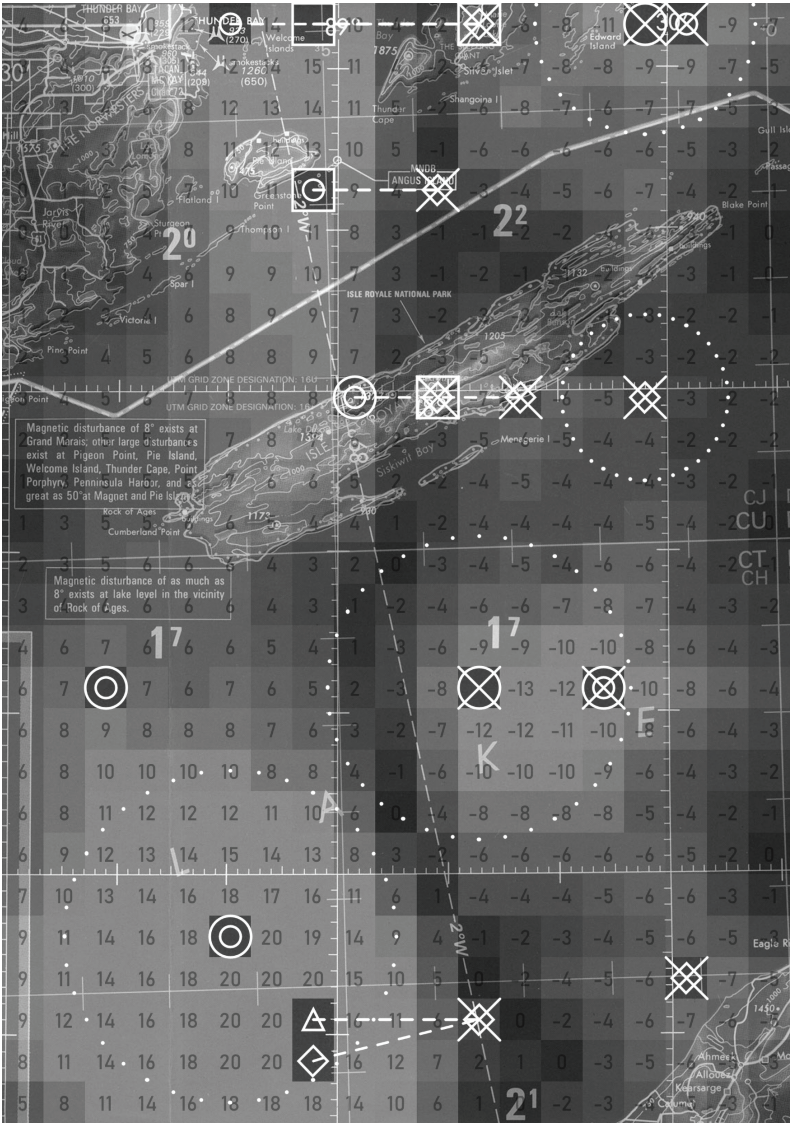

Larix gmelinii, Pinus sylvestris var. mongolica forest, TPC G-9D

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Mangroves of the Western Coral Triangle, TPC L-12D

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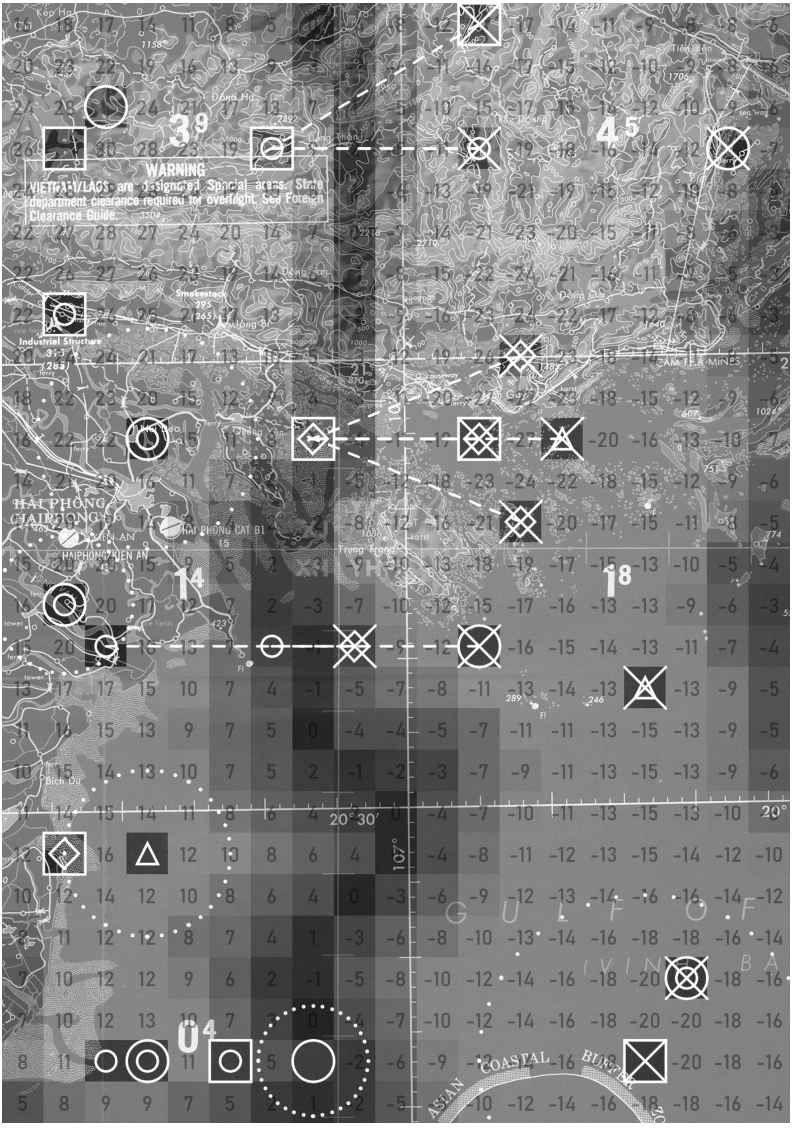

Mangroves of the South China Sea, TPC J-11A

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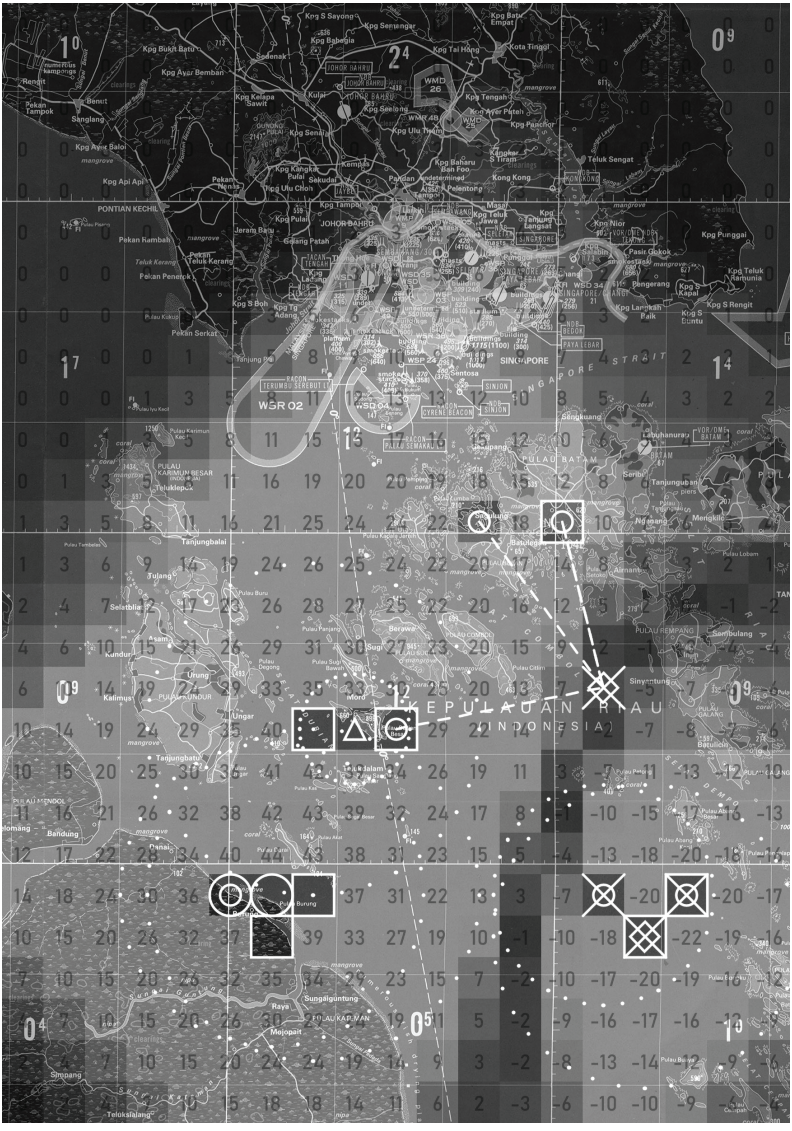

Mangroves of the Sunda Shelf, TPC L-10C

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Sources

War Machine was composed on a largely ad-hoc basis from September 2021 until June 2024. Over this time, it employed a mass of found and remixed materials derived from a variety of online sources, chiefly extracts from varied published marketing reports concerning the global state of oil, gas, and mining, as well as CC-licensed academic texts. Therefore, the sources below should only be taken as an illustrative sample of some of the materials used in the composition of each plate.

The Tactical Pilotage Charts for all the regional maps were sourced from the open access Perry-Castañeda Library Map Collection at the University of Texas at Austin. They are available online at the now archived site https://maps.lib.utexas.edu/maps/tpc/.

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